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WILDLIFE SURVEY
OF THE
CUYAHOGA VALLEY NATIONAL RECREATION AREA

PREPARED FOR:

United States Department of the Interior
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ABSTRACT

A Wildlife Survey of the

Cuyahoga Valley National Recreation Area

An inventory of the amphibians, reptiles, birds, and mammals of the Cuyahoga Valley National Recreation Area (CVNRA) in northeastern Ohio was prepared through field studies from the summer of 1982 to the fall of 1983 and from CVNRA and literature records. Extensive collecting efforts were directed toward habitats thought to support rare and endangered species.

Amphibians were collected with dip nets, minnow seines, minnow traps, and by hand in day and night collecting. Aquatic turtles were collected with hoop nets while other terrestrial reptiles were collected by hand. Snap traps and pit traps were employed in collecting small mammals while mist nets were used in inventorying bat populations. Breeding birds were surveyed by selecting four sites representing the most common habitats in the CVNRA for intensive censusing and by surveying 20 other areas through more casual sight and sound identifications. National Audubon Society Breeding Bird Census techniques were employed in censusing the four sites, plotting each bird encountered within the census area on a grid; information regarding gender, territorial activity, nesting activity, as well as other information pertaining to the identification of resident individuals was also recorded.

Species names, habitats, and distribution maps are included for all amphibians, reptiles, and mammals collected or observed within the CVNRA.

The 19 amphibians recorded for the CVNRA included 10 salamander species, 1 toad species, and 8 frog species. The Spotted Salamander (Ambystoma maculatum) was a new addition to species lists prepared by previous investigators. Included in the herpetofauna is one endangered species, the Spotted Turtle (Clemmys guttata) and two rare species that have been classified as "Special Animals" by the Ohio Natural Heritage Program, the Smooth Green Snake (Opheodrys vernalis) and the Red-eared Slider (Pseudemys scripta).

Thirty-one species of mammals were documented as being found within CVNRA boundaries. Although this inventory is thought to be relatively complete, future collecting may yield such species as Keen's Myotis (Myotis keenii), the Silver-haired Bat (Lasionycteris noctivigans), the Hoary Bat (Lasiurus cinereus), the Eastern Pipistrelle (Pipistrellus sabflavus), the Pine Vole (Microtus pinetorum), the Southern Bog Lemming (Synaptomys cooperi), the Deer Mouse (Peromyscus maniculatus) and the Coyote (Canis latrans).

A literature survey plus field research in this study indicates that 150 breeding bird species are found within the CVNRA including 110 regular and 40 irregular species. One-third of these species were found in forested habitats, one-third depended on wet meadow habitats, and one-third were highly dependent on habitats such as oldfields and suburban areas created by disturbances. Because the wetland and disturbance habitats do not share many species in common, one-third of all CVNRA species are highly dependent on these last two habitats together. Of the 150 summer CVNRA species, 104 were encountered and observed in the field during this study. Noteworthy bird species whose presence in the CVNRA may be considered encouraging and of special

interest include the Wood Duck, Turkey Vulture, Broad-winged Hawk, Spotted Sandpiper, Yellow-billed Cuckoo, Belted Kingfisher, Eastern Phoebe, Bank Swallow, Northern Rough-winged Warbler, Prairie Warbler, Louisiana Waterthrush, Hooded Warbler, and Yellow-breasted Chat. Twelve blue-listed species which are considered as regular species in the CVNRA are the Least Bittern, American Bittern, Sharp-shinned Hawk, Red-shouldered Hawk, King Rail, Ruby-throated Hummingbird, Hairy Woodpecker, Eastern Meadowlark, and Grasshopper Sparrow. Of these, the King Rail, an endangered species in Ohio, was observed in this study.

Nineteen extirpated species including 14 mammal species and 5 bird species are listed for the area now occupied by the CVNRA and recommendations are made for maintaining extant species in the CVNRA within the limits of U.S. Park Service policies. Specific research needs for continued management of CVNRA wildlife are also included in the report.

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INTRODUCTION

The purpose of this study is to produce an inventory through field and literature surveys of the extant amphibian, reptile, bird, and mammal fauna on federally-owned lands within the boundaries of the Cuyahoga Valley National Recreation Area. The inventory will not include species collected within Akron or Cleveland metropolitan parks which at this time have not become incorporated within the CVNRA; i.e. Bedford, Brecksville, Furnace Run, Hampton Hills, O'Neil Woods, and Deep Lock Quarry Metropolitan Parks. Specific attention will be given to those species which are rare or endangered by mapping their distributions and by describing their habitats. Similar kinds of descriptions will also be given for native species which have been extirpated from this area of northeastern Ohio.

The earliest attempt to inventory Ohio amphibians and reptiles (herpetiles) was done by Kirtland (1838) in which he listed 17 amphibian species and 27 reptile species, primarily from collections made in northeastern and southwestern Ohio. The second inventory of Ohio herpetiles was produced by Smith (1882) who included 25 species of amphibians and 40 snake species on his list, prepared primarily from records and specimens provided to him by other herpetologists. However, the first compilations which were based on extensive field

work and thus appear to have been relatively complete are works by Wilcox (1891) on amphibians in which he listed 30 species for the state and Morse (1904) who recorded 32 amphibian species and 40 reptile species. As the tempo of collecting in the state increased with improved highways, Charles Walker played an important role in collecting, interpreting, and summarizing amphibian records in his excellent volume on the frogs and toads of Ohio (1946). This book along with Conant's work on reptiles (1951) are the two most important sources of bench mark data which can be used for comparative purposes in surveys such as this one in determining possible changes in herpetile distributions over the past 50 years. More recent studies which have concentrated on the herpetiles of northeastern Ohio include brief reports by MacLaren (1959), Weyland et al. (1958), and Wood (1959). More comprehensive studies which involved extensive field work include Fischer's survey of the reptiles of Summit County (1965) and Sipes' survey of the salamanders of eight northeastern Ohio counties (1964), including the area now occupied by the CVNRA. Another study which involved minimal field work but summarized much of the biological literature relevant to the area now occupied by the CVNRA is that of Jack McCormick Associates (1975). This excellent study proposed an inventory of the fauna and flora of the Cuyahoga Valley based primarily on museum and literature reords as well as on speculation by professional biologists in the area as to what species should be in the valley. Finally, two recent studies which summarized museum and literature records for the herpetiles of the CVNRA and added new records in three years of field collecting are those by Orr

(1978, 1980). These studies included records from Cleveland and Akron metropolitan parks which at the time of the surveys were eventually to have been incorporated into the CVNRA. The studies documented 23 amphibian species and 16 reptiles including one endangered species, the Spotted Turtle. Because the herpetiles of the CVNRA have been relatively well studied, this study will concentrate collecting efforts on those species which have not yet been reported for the Park but have a high probability of being there.

The mammals of Ohio and specifically those in the CVNRA, are less well known than the lower vertebrates. Kirtland's 1838 publication again marks the beginning of recorded information in Ohio on the state's mammalian fauna. In this publication he lists 50 species for the state. Another early inventory of Ohio mammals is that of Brayton (1882). Once early collectors had provided species lists and distributions, others such as Enders (1930) and Thomas (1951) attempted to explain these distributions in terms of their relationship to the major physiographic provinces of the state and to their origins as influenced by such factors as glaciation and European settlement. The most valuable study in terms of providing records and life history information of mammals in the vicinity of the CVNRA is that of Bole and Moulthrop (1942). They list a total of 41 extant species from Summit and Cuyahoga Counties. The more recent regional work by Burt (1957) indicates that the ranges of 43 mammals fall within the area occupied by the CVNRA while Hamilton and Whitaker (1979) lists 42 mammals in this region of Summit and Cuyahoga Counties. Finally, the long-awaited work by Gottschang (1981)

summarizes most of the Ohio mammal literature since the Bole and Moulthrop monograph. Based on Gottschang's range maps, 45 mammal species should be found within the CVNRA. However, as mentioned earlier, the mammals of Ohio are not well known and therefore differences between species lists would be expected. It is gratifying to know that certain areas such as the lands within the CVNRA in Ohio will be maintained in a natural state so biologists will have an opportunity in studies such as this one to accurately assess the species composition of this area of northeastern Ohio.

The survey of birds concerned only species which might be residing and completing breeding activities in CVNRA habitats during the summer--roughly late May through early September. In planning this work, it was clear that there would be need for some special considerations in producing a useful data base on CVNRA's avifauna. Due to the limitations of time and manpower, it would not be possible to achieve a full evaluation of avifauna for all the park.

The number of species whose range includes CVNRA is large. So is the variety of habitats in which they might be expected to occur. These conditions, and the ease with which birds can move in response to environment, reduce the accuracy of any descriptions drawn up on the basis of one season.

This would be the case especially for endangered and threatened species. By definition, these occur at such low densities and often so locally that devoting time and other resources specifically to searching for them would be wasteful. Instead, the potential for occurrence of such species might be better inferred from the presence

of the birds which characterize the most important habitats at CVNRA.

Also, some effort in the study was to be devoted to casual visitation and survey of sites ("birdwalks") but it was felt that this could not produce reliable population density data on any bird species, endangered or otherwise. Density data would be best to assess habitats in monitoring and planning management practices in the park.

So, in addition to casual surveys, the approach pursued was to census, by a standard procedure, the birds present in particular small areas. These areas were to be chosen as being representative of important habitats in the park or of special habitats of interest.

An additional benefit expected from this approach was information on populations of bird species whose success in CVNRA is noteworthy. Such species might deserve consideration in management, perhaps even more so than endangered species whose status potential in CVNRA is less clear.

Some east-central North American birds which might be succeeding in CVNRA have in fact, declined elsewhere within their range. These declines are most often linked to habitat destruction. CVNRA might make a significant contribution as a refuge for such troubled species. These species have in the past decade been recognized most reliably in the National Audubon Society Blue List program (Arbib 1972). The occurrence of blue-listed species in CVNRA was considered a point of particular interest in this study, both in casual surveying and in intensive censusing.

The geographical and physiographical position of CVNRA is

transitional between several major biotic associations. Thus, it is at the "corner" of the ranges of several birds, some characteristic of the eastern boreal and montane forests, some of the southern hardwood forests, and some of the central prairies. CVNRA probably provides marginal conditions for survival of these species, and a few individuals of each may be expected irregularly. However, the rarity of these marginal species might not be considered a condition to be "remedied" by management. It was felt that such unusual bird species must be distinguished from the usual species, if the survey information is to be interpreted and used realistically.

Management objectives of CVNRA may call for re-establishment of habitats typical of the region or development of special public-use sites. Manipulations for these purposes may involve either halting cutting programs or, conversely, undertaking or continuing cutting at the site. The potential effects of these actions on avifauna at a site was a question of interest which was also addressed in the project.

We would like to express our appreciation to the many individuals who contributed to this survey. Tim Savisky, Gary Hantsbarger, Douglas Dunn, and Bill Young assisted the authors in collecting specimens and in making field observations while Robert Capanna and Ronald Stewart provided us with additional records. We especially appreciated the complete cooperation provided to us by Park personnel in locating specific habitats, in gaining access to certain areas, and in providing us with records of wildlife observations. These individuals include Garree Williamson, Steven Elkinton, Rod Royce,

Charles Lebeda, Brian McHugh, and Mark Hill. Finally, we thank CVNRA Park Superintendent Lew Albert for permission to conduct this investigation in the Park.

Materials and Methods

Field work on this wildlife survey was initiated in the summer of 1982 and was terminated in the fall of 1983. Collecting was concentrated in those habitats which would most likely produce species as yet unreported for the Park but which had a relatively high probability of being there. Attempts were also made to increase the number of locality records for rare and endangered species.

Plethodontid or lungless salamanders were collected by turning over rocks, logs, and debris along streams, on the forest floor, and in seepage areas. Most of our salamander collecting efforts, however, were directed toward locating temporary breeding pools occupied by Ambystomatid or mole salamanders, a group which has seldom been collected in the Park. These ponds were located by using aerial photographs, by consulting with Park personnel, and by searching mature woodland areas for the ponds. Once the ponds were located, dip nets, minnow seines, and minnow traps were used to search for larvae in the ponds. Larvae were returned to the laboratory and reared to metamorphosis for positive identification. Frogs and toads were collected with dip nets and by hand in day and night collecting. Breeding aggregations of anurans were located by listening for their calls while driving along Park roads at night.

Turtles were collected by placing 30" hoop nets in ponds and in the Ohio and Erie Canal while snakes were collected by hand in aquatic and terrestrial habitats. Small mammals were collected by setting trap lines of Museum Special and Victor snap traps. Tin can pit traps

were also employed in collecting shrews, moles, and other small mammals. Mist nets were placed over openings in barns and across streams to inventory the bat populations of the Park. All visual sightings of larger mammals and their sign by project investigators and by Park personnel were recorded. Only difficult to identify specimens were returned to the laboratory for detailed examination of teeth or for precise measurements of appendages. All other specimens were released at the point of capture.

Common nomenclature for birds has become so rigidly codified in this country that, in this report, common names are used exclusively, with no reference to scientific binomials. All species recognized and common names used are those currently accredited by the American Ornithologists' Union (1982, 1983). Systematic classification and sequence of species is that of older revisions (AOU, 1977), as adopted in Peterson's most recent (1980) field guide. Up-to-date taxonomy may be discovered in the latest revision of the AOU check-list.

In the study of avifauna, areas of interest were visited by contract personnel in late summer of 1982 and from mid-spring through late summer of 1983. Observations were accumulated during a total of 43 trips to CVNRA, over a total period of 159 hours, averaging 3.7 hours per trip. Both casual survey sites and intensive census sites were visited, usually more than one site on each trip. Some of the time in the field was spent preparing census sites, but observations of birds were recorded whenever they occurred, from all trips, even when made from the car in transit.

All birds detected and identified by sound or by sight , or both,

were recorded as encounters. It is difficult to assess "mistakes" in field identification of birds, but it may be noted a small fraction of birds detected went unidentified--well less than 1%. Certain quiet or elusive species were certainly missed during visits because of inadequate efforts to detect them. Playback of tape-recorded sounds during two visits to one site induced some rails (Rallidae) to reveal themselves. Equipment failures stymied use of the same technique for goatsuckers (Caprimulgidae), barn-owl (Tytonidae), and owls (Strigidae).

Through the 1982 and the earliest 1983 visits, four sites were chosen for intensive censusing. The census procedure followed as closely as possible the specifications of the National Audubon Society Breeding Bird Census program. This spot-mapping technique was chosen because it is a generally recognized standard for most accurate censusing. The data gathered in this way would provide a basis for comparison with other such studies. Annual compilations of these have been published in the journals of the NAS, Audubon Field Notes and its successor American Birds, over the past 46 years.

Boundaries of the census sites and transecting grid lines were established by measurement with a vinyl-coated nylon-cloth surveying tape. Intervals between grid lines were about 50 m. In some cases, the grid lines were not precisely rectangular, but their function was to subdivide the total study area into a system in which positions could be easily recognized for mapping. For each census site, area determinations were made from topographical and aerial maps, in comparison to lines of known measurement.

On each visit to a census site, the grid lines and, when appropriate, also the boundaries of the area were walked systematically. The exact pathway followed a somewhat different order each time to avoid effects of diurnal change in species detectability in different parts of the area. Each individual bird encountered during the walk was identified and its position mapped within the grid as closely as possible. Accuracy of positions on the spot-map seemed usually within 15 m and often within 10 m. Gender, territorial activity (singing especially), nesting activity, simultaneous detection of other individuals of the same species, and other information pertaining to identifying the occurrence of particular resident individuals were also recorded with each encounter.

Each census area was visited at least five days during the summer, scheduled at 7-10 day intervals during June. Cumulative records from daily spot-maps could then be used to identify clusters of occurrences of individual residents, establishing with high likelihood the actual number of males or pairs of species in breeding condition.

Visits at both survey and census sites also provided opportunity to record some observations about the vegetation. Three sites visited for survey were abandoned gravel/sand quarries. At two of these, nesting Bank Swallows were present, and the overall size of the colonies were estimated from sketches and photos of burrows.

RESULTS

Amphibians and Reptiles

Field studies in this survey in addition to literature and museum surveys document the presence of 10 salamander species, 1 toad species, and 8 frog species in the Cuyahoga Valley National Recreation Area. This study has added one new salamander species, the Spotted Salamander (Ambystoma maculatum), to the species list prepared by Orr in previous studies (1978, 1980) and has added new locality records for 10 other amphibian species. A listing of all amphibians collected in the Park is given in Table 1 along with the habitats of those species. In the species accounts given below, locality records from this and previous field studies are given. Those records that were precisely described in the literature or in field notes are plotted on Peninsula or Northfield Quadrangles of U.S. Geological Survey topographic maps in Figures 1-17d. As indicated earlier, records are not included for metropolitan parks currently under the jurisdiction of Cleveland or Akron. The taxonomy and relative abundance of each species are given in the species accounts. Smith (1978) is followed for the taxonomy of the amphibians used in this report.

TABLE 1. Amphibians known to occur in the Cuyahoga Valley National Recreation Area. Breeding habitats are underlined and preferred habitats are indicated with an asterisk (*). Numbers in parentheses identify habitats on an existing CVNRA Vegetation Study Map. A cross (+) indicates species observed by project investigators.

SPECIES	Maple-Sycamore Forest (1)	Oak-Beech-Maple Forest (2+5)	Hemlock-Beech Forest (3)	Oak-Hickory Forest (4)	Maple-Oak Forest (5)	Scrub-Oldfield (6)	Wet Meadow (7)	Cultivated Field-Orchard (8)	Pine-Spruce Forest (11)	Swamp	Ponds and Lakes	Stream-Stream Edge
Eastern Newt +	x	x	x		x					x	x*	x
Jefferson's Salamander +	x	x*	x		x					x	x	
Spotted Salamander	x	x*	x		x					x	x	
Northern Dusky Salamander +												x*
Two-lined Salamander +												x*
Long-tailed Salamander +	x	x	x		x							x*
Slimy Salamander +	x	x	x*	x	x				x			
Red-backed Salamander +	x*	x*	x*	x	x				x			
Ravine Salamander			x*									
Red Salamander +										x		x

TABLE 1. (Continued). Amphibians known to occur in the CVNRA.

SPECIES	Maple-Sycamore Forest	Oak-Beech-Maple Forest	Hemlock-Beech Forest	Oak-Hickory Forest	Maple-Oak Forest	Scrub-Oldfield	Wet Meadow	Cultivated Field Orchard	Pine-Spruce Forest	Swamp	Ponds and Lakes	Stream-Stream Edge
American Toad+	x	x*	x	x	x	x	x	x	x	x	x	x
Peeper Tree Frog +	x	x*	x		x		x			x*	x	x
Greater Gray Treefrog +	x	x	x		x		x			x*	x	
Northern Chorus Frog +	x	x	x		x		x			x*	x	x
Pickerel Frog +	x	x	x	x	x	x	x			x	x	x*
Leopard Frog	x	x	x	x	x	x	x*			x	x	x
Green Frog +	x	x	x	x	x		x			x	x*	x
Bullfrog +	x	x	x	x	x		x			x	x*	x
Wood Frog +	x*	x*	x	x	x		x			x	x	x

Amphibians

ORDER: Caudata

FAMILY: SALAMANDRIDAE

Eastern Newt, Notophthalmus viridescens viridescens

Virtually every abandoned farm pond within the Park supports a population of Eastern Newts so the distribution maps in Figures 1a and 1b show only a few of the many localities of this interesting salamander. The fact that the species is neurotoxic allows it to coexist in ponds with fish which normally would prey upon them. An unusually large population is found with goldfish in the pond shown in Figure 1b.

LOCALITIES: Figs. 1a,b. Approximately 0.4 mile northeast of Boston Mills - Turnpike intersection in pond; in pond on south side of Hines Hill Rd. 1 mile west of Brandywine Rd.; in pond off Hines Hill Rd. 0.2 mile west of above pond; pond 0.1 mile north of Pine Lane off Rt. 303 east of Peninsula; swamp east of entrance to Kendall Lake; Riverview Rd. south of Peninsula at railroad crossing.

CURRENT STATUS: Common

FAMILY: Ambystomatidae

Jefferson's Salamander, Ambystoma jeffersonianum

The members of this family of mole salamanders are seldom found above ground, spending most of their lives under the soil surface. Therefore adults are best found in their temporary pond breeding areas early in the spring when they are mating. Larvae can be found in these ponds after they hatch in the spring until they metamorphose and

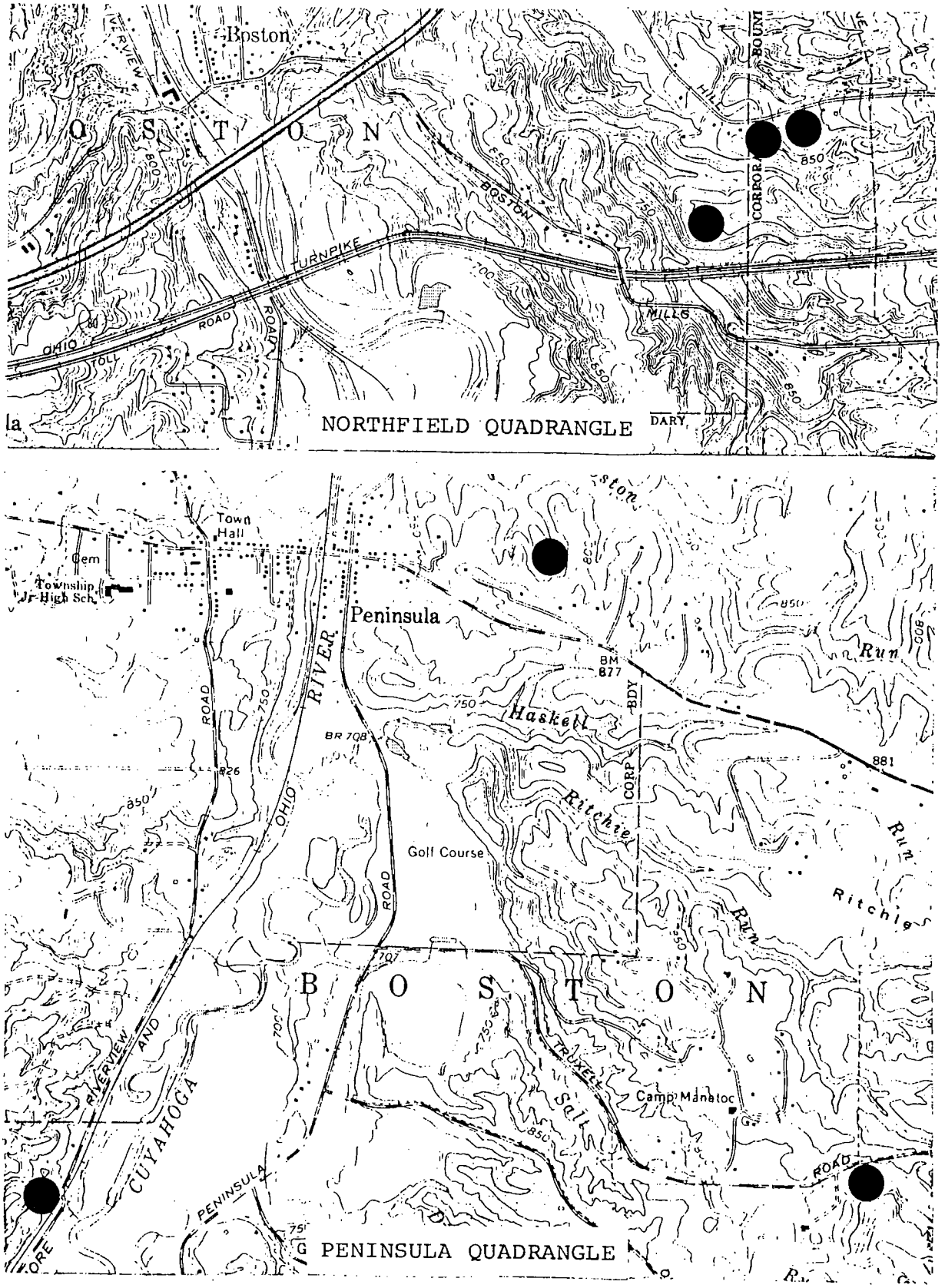


Fig. la. Collection sites for Eastern Newts.

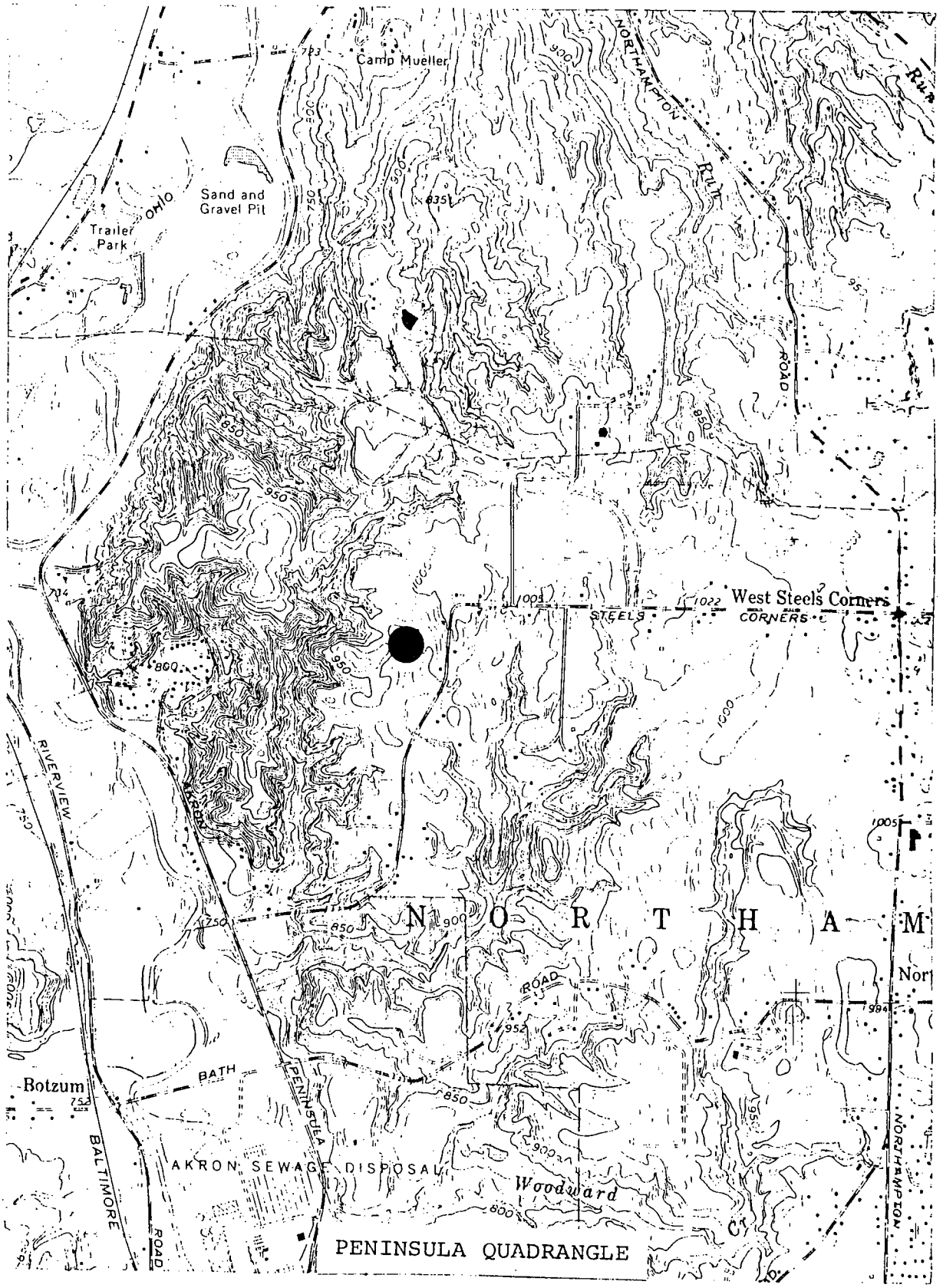


Fig. 1b. Collection site for Eastern Newts (continued).

leave the ponds in late summer or fall. After many weeks of searching, four additional locality records were obtained for Jefferson's Salamander. All of these populations except the record off Oak Hill Rd. were found in their breeding ponds. To insure correct identification of the difficult to identify larvae, all larvae were returned to the laboratory where they were reared to metamorphosis. They were then returned to the ponds.

LOCALITIES: Fig. 2. Along Riverview Rd. in temporary pond on east side of road 0.5 mile north of Everett Rd. intersection; single adult found in ravine east of spur road leading off Oak Hill Rd.; off Wheatley Rd. in pond east of lane; off bike trail (old railroad grade) in pond north of Hines Hill Rd. to power line; in pond 0.4 mile northeast of Boston Mills - Turnpike intersection.

CURRENT STATUS: Uncommon

Spotted Salamander, Ambystoma maculatum

Two records for this new addition to the Park herptofauna were obtained in our survey. Robert Capanna, an area naturalist, informed us that he collected larvae from the temporary pond indicated in Fig. 3 and reared them to metamorphosis. A second breeding pond was reported to us by Barbara Byrne, Camp Manager of Camp Ledgewood on Akron-Peninsula Rd. She reported seeing approximately 40 adults on April 10, 1984 in a pond under a large Oak tree approximately 0.25 mile north of Akron-Peninsula Rd. at a point approximately 0.2 mile west of the entrance to Camp Ledgewood.

LOCALITY: Fig. 3. From Crow Foot Gulley Parking lot on Quick Rd.,

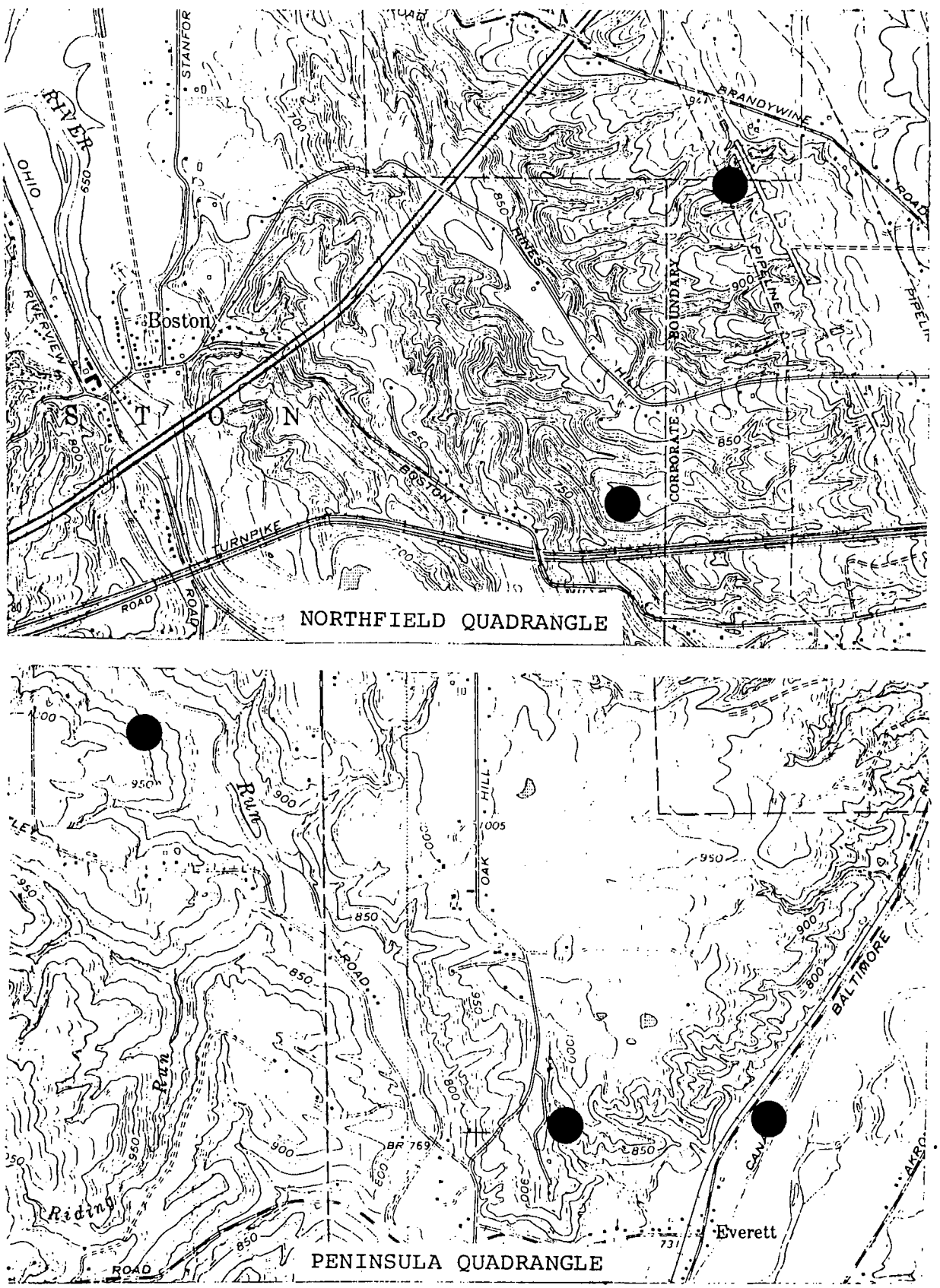


Fig. 2. Collection sites for Jefferson's Salamanders.,

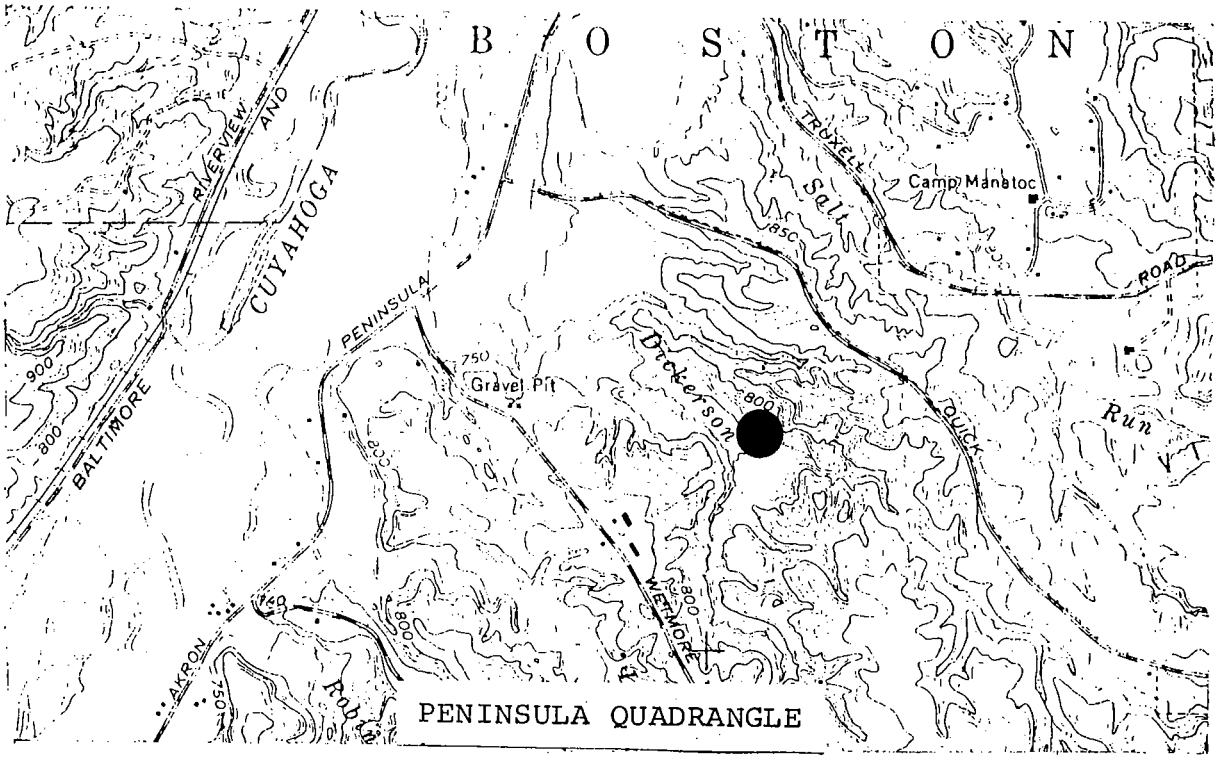


Fig. 3. Collection site for Spotted Salamanders.

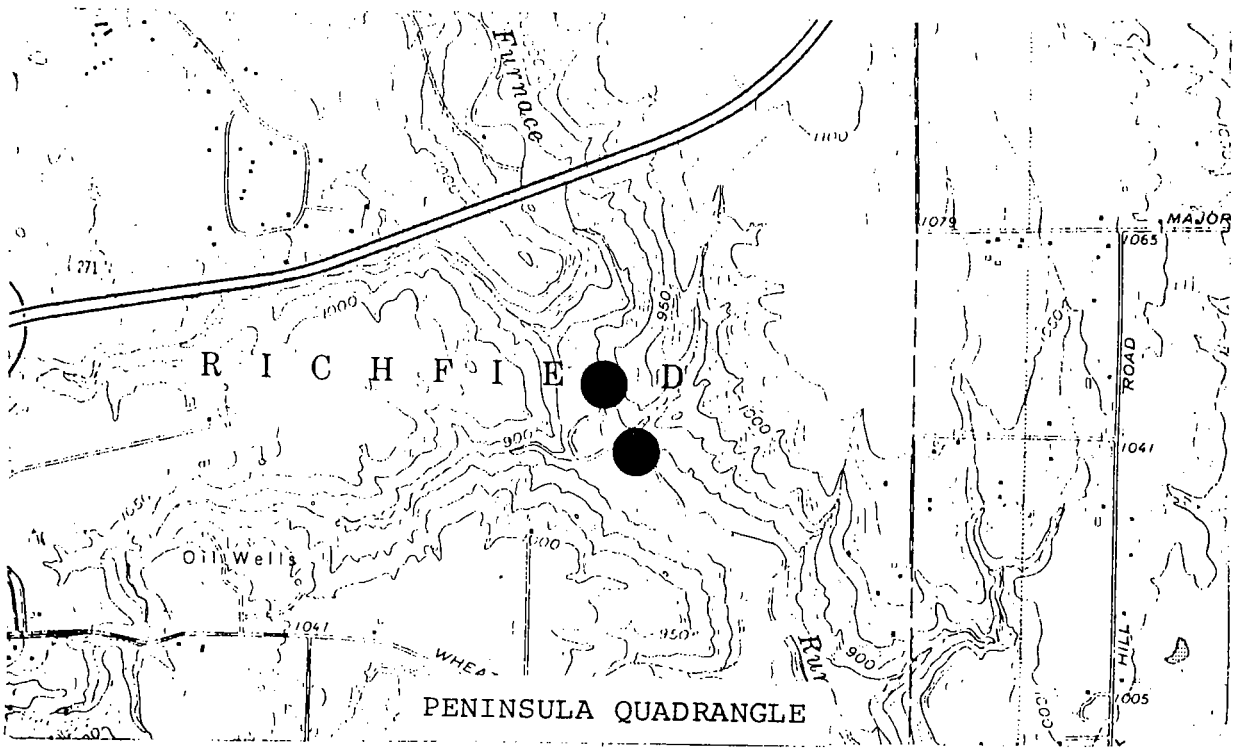


Fig. 4a. Collection sites for Northern Dusky Salamanders.

proceed to vicinity of Dickerson Run near the confluence of the two forks of the stream.

CURRENT STATUS: Rare

FAMILY: Plethodontidae

Northern Dusky Salamander, Desmognathus fuscus fuscus

Although this species is normally abundant along clean streams and seepage areas in most of Ohio, it is not as common as might be expected in similar habitats in the CVNRA. However, diligent searching normally produces a few individuals under rocks and debris along small streams where they coexist with Two-lined Salamanders. Because many of the tributaries of the Cuyahoga River in the CVNRA are relatively unpolluted, they undoubtedly support populations of this common species.

LOCALITIES: Fig. 4a and 4b. Along Ritchie Run at the Octagon off Truxell Rd.; Haskell Run, Ritchie Ledges; West Forest Trail, Octagon; along Ice Box Trail, Ritchie Ledges; ravine east of spur road off Oak Hill Rd.; Boston Mills Rd. 0.7 mile west of Akron-Peninsula Rd.; Furnace Run at Wheatley Rd.

CURRENT STATUS: Common

Red-backed Salamander, Plethodon cinereus cinereus

This terrestrial salamander is best found in early spring when the forest floor is very moist. It is found under logs in mature deciduous forests and is one of the most abundant of all vertebrates in the Park.

LOCALITIES: Figs. 5a and 5b. In vicinity of Salt Run off Truxell Rd; in wooded area by Ritchie Run at the Octagon; at vicinity of waterfalls off Boston-Mills Rd., 017 mile west of Riverview Rd.; along ravine east of spur road off Oak Hill Rd.; ravine west of Riverview Rd. 0.6 mile south of Major Rd.; Ice Box Trail, Ritchie Ledges; along stream paralleling Truxell Rd.; Kendall Lake,; West Forest Trail, Octagon,; Boston Run at Camp Ledgewood; Haskell Run, Ritchie Ledges.
CURRENT STATUS: Common

Ravine Salamander, Plethodon richmondi richmondi

Only one specimen of this species has been reported from the area now occupied by the CVNRA. This individual was collected in 1931 by C. F. Walker and E. S. Thomas and is currently in the Ohio State University Museum (#1438). The locality is given as "Summit Co., Brandywine". This species is restricted to the wooded slopes of ravines and is normally not sympatric with the Mountain Salamander (Desmognathus ochrophaeus), which is found to the north of the CVNRA but not in the Park (Orr, 1978). Therefore, we feel the Ravine Salamander is probably in the Park although we have been unable to locate it in three years of intensive collecting.
CURRENT STATUS: Rare if present at all.

Slimy Salamander, Plethodon glutinosus glutinosus

This handsome terrestrial salamander is relatively common under rocks and logs on the slopes of mature deciduous forests in the Park. Like the Red-backed Salamander, it is most easily found in early

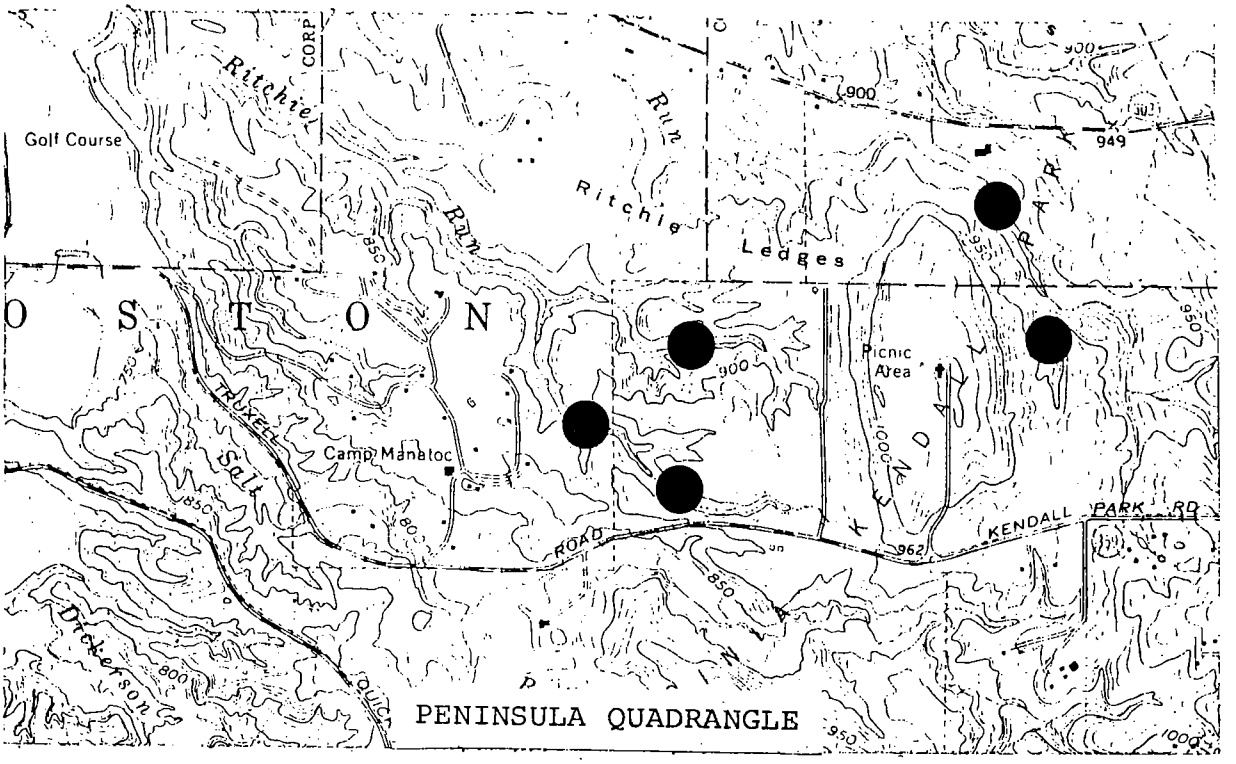


Fig. 4b. Collection sites for Northern Dusky Salamanders (continued).

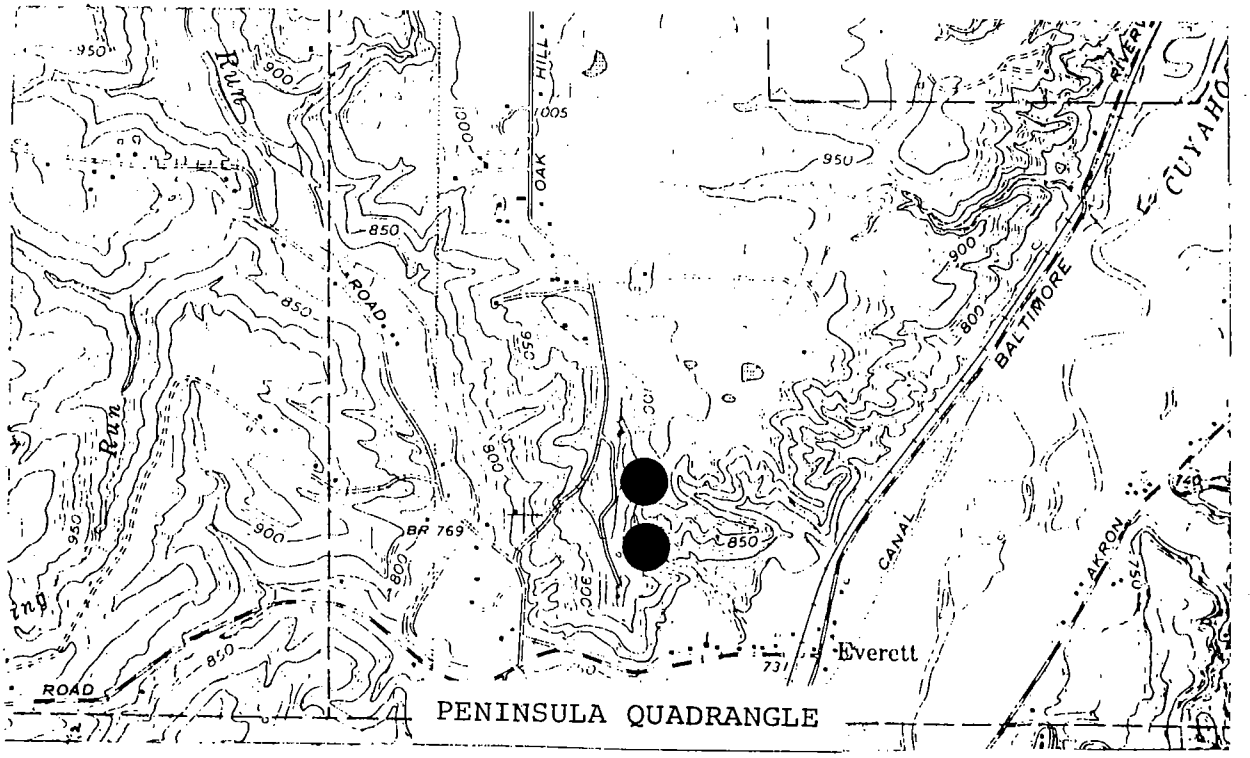


Fig. 5a. Collection sites for Red-backed Salamanders.

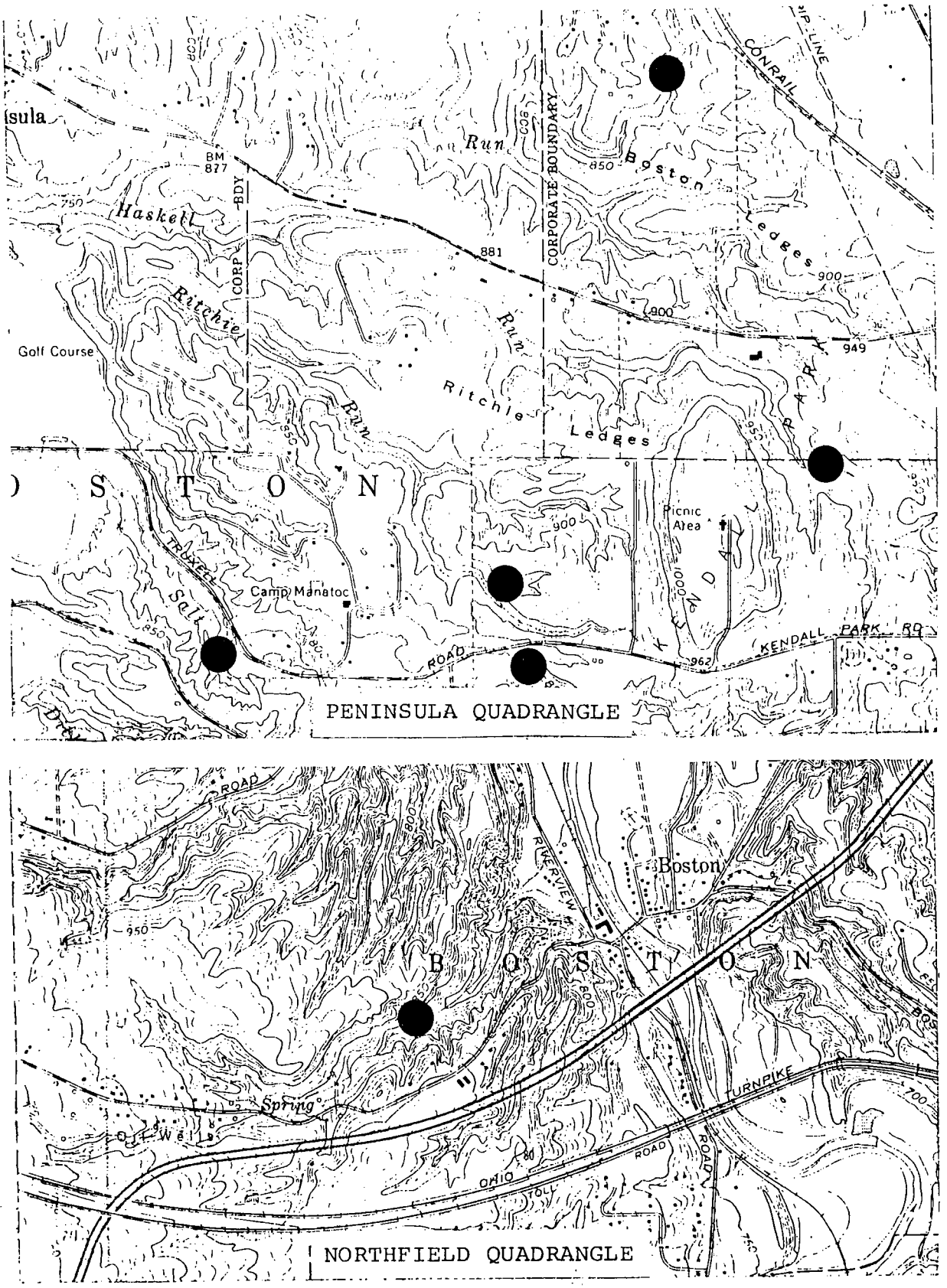


Fig. 5b. Collection sites for Red-backed Salamanders (continued).

spring when the decaying humus of the forest floor is moist.

LOCALITIES: Fig. 6. Off bike trail in eastern part of Camp Ledgewood; off Wheatley Rd., 0.5 mile east of Revere Rd.; north off Hines Hill Rd. along bike trail (railroad grade); ravine east of spur road off Oak Hill Rd.; ravine west of Riverview Rd. 0.6 mile south of Major Rd.; Boston Mills Rd. 0.7 mile west of Riverview Rd.; Riverview Rd. south of Peninsula at railroad crossing; ravine east of spur road off Oak Hill Rd.

CURRENT STATUS: Common.

Northern Two-lined Salamander, Eurycea bislineata bislineata

This species is probably the most common salamander species in the Park, being found in shady areas under rocks, logs, and other substrates at the edge of small, clean streams.

LOCALITIES: Fig. 7a and 7b. Salt Run off Truxell Rd.; Ritchie Run at Octagon off Truxell Rd.; in ravine east of spur road off Oak Hill Rd.; along Brandywine Creek north of Stanford Rd.; ravine west of Riverview Rd. 0.6 mile south of Major Rd; along Columbia Run off Riverview Rd.; Boston Mills Rd. 0.7 mile west of Akron-Peninsula Rd.; Haskell Run, Ice Box Trail, Ritchie Ledges; Cuyahoga River near Ira Rd. - Akron Peninsula Rd. intersection; Hemlock Trail, Ritchie Ledges,; Riverview Rd., south of Peninsula at railroad crossing; Furnace Run by Wheatley Rd.

CURRENT STATUS: Common.

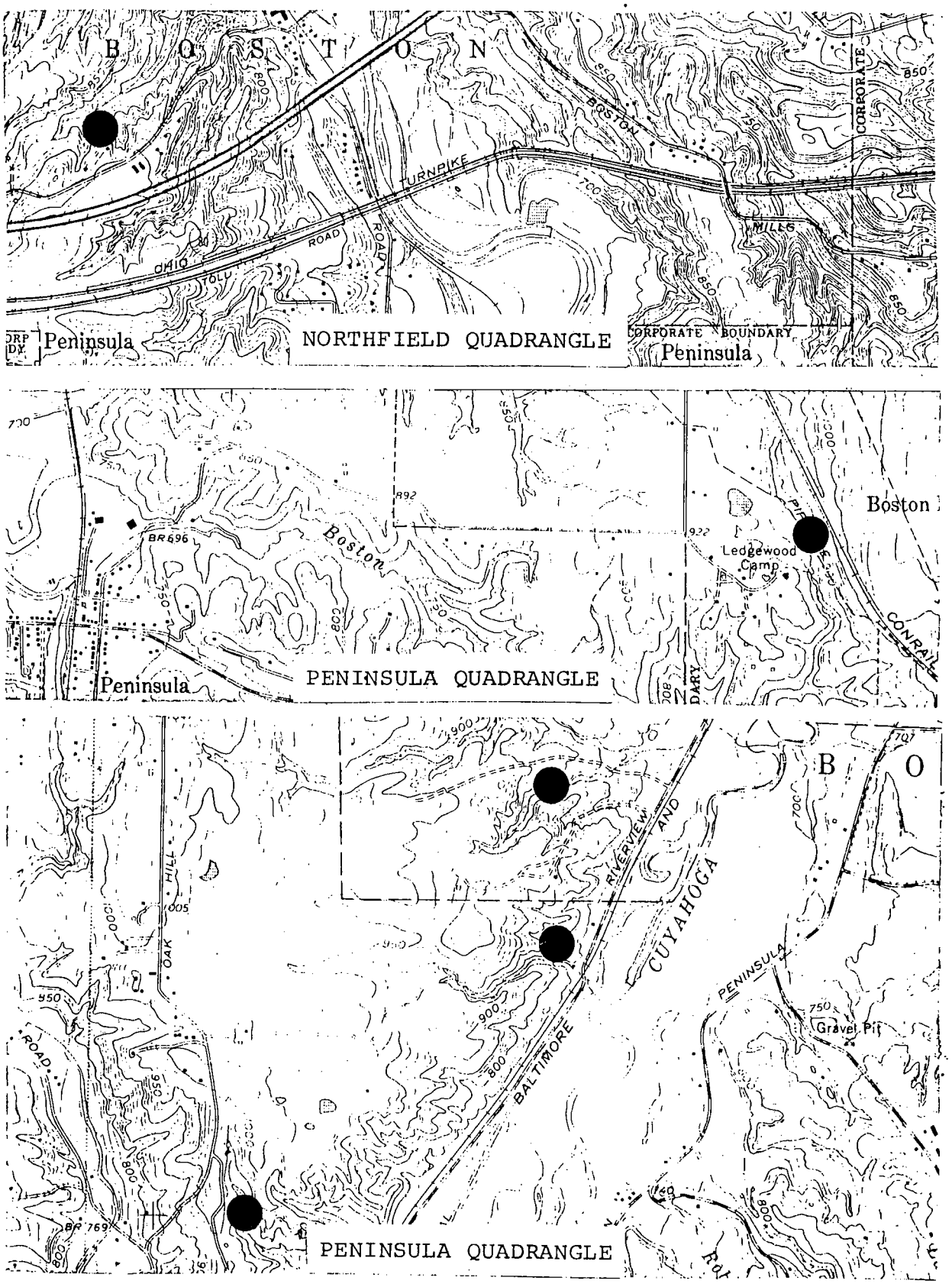


Fig. 6. Collection sites for Slimy Salamanders.

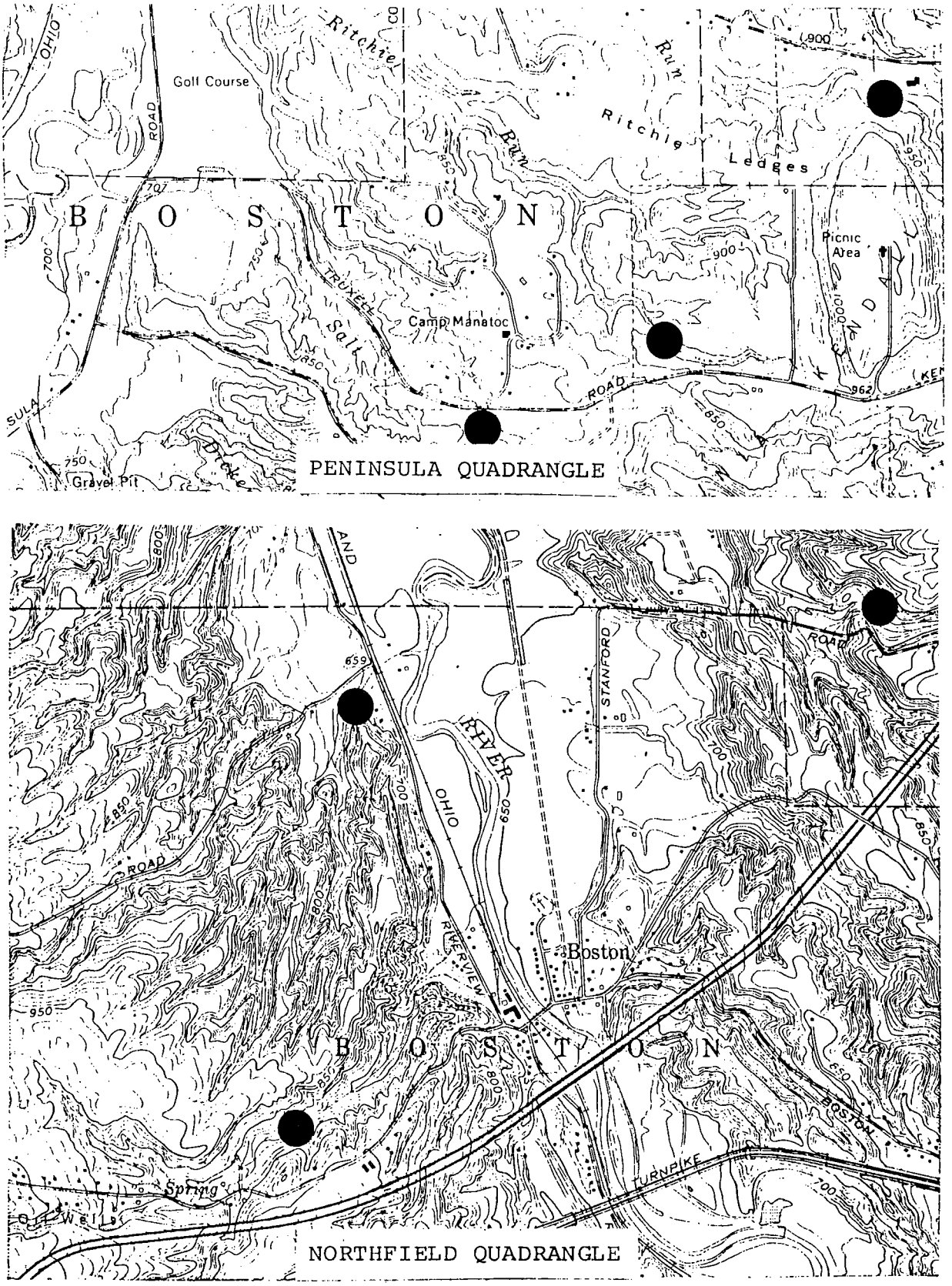


Fig. 7a. Collection sites for Two-lined Salamanders (continued).

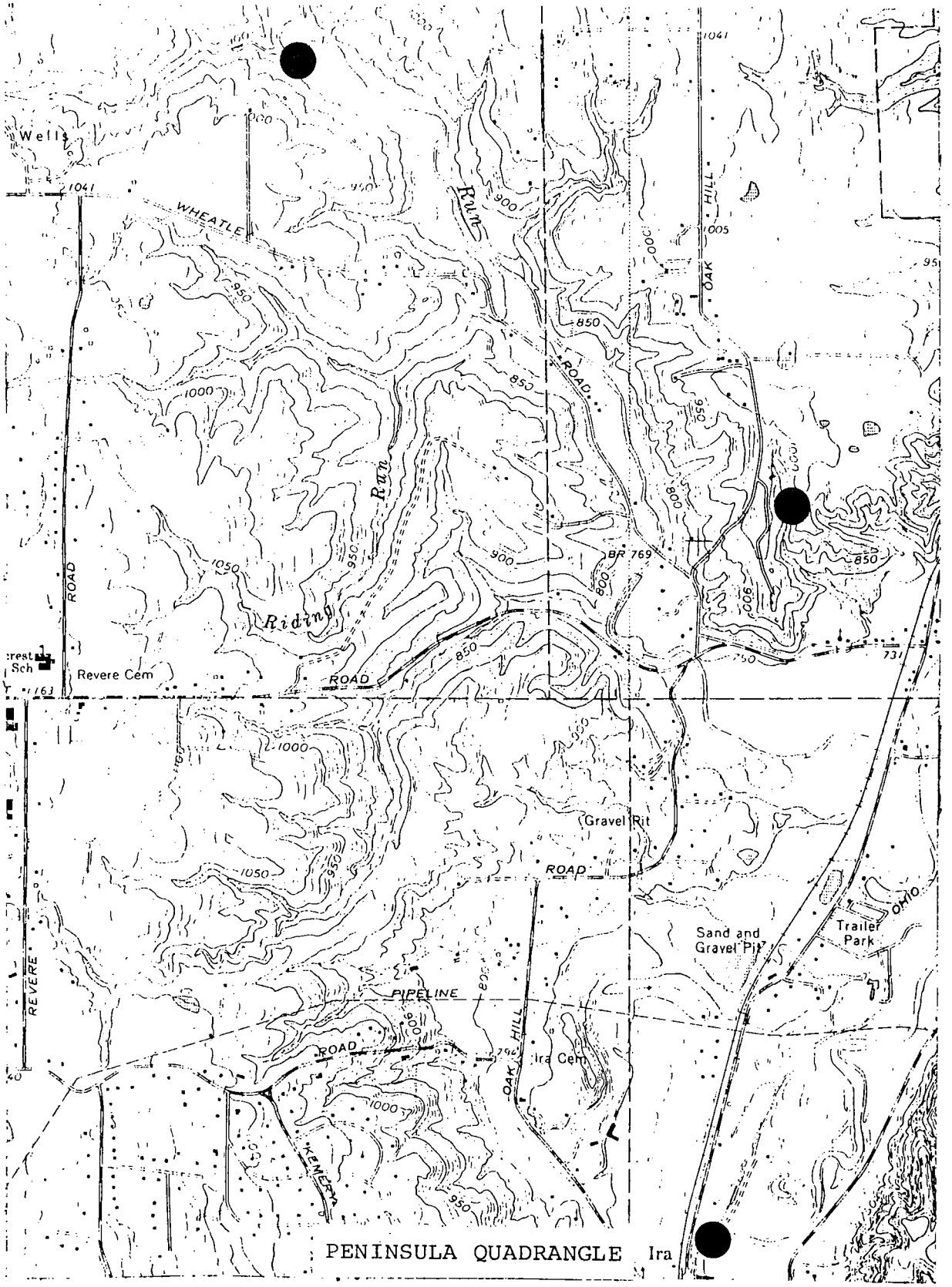


Fig. 7b. Collection sites for Two-lined Salamanders (continued).

Long-tailed Salamander, Eurycea longicauda

We have been able to locate this beautiful yellowish-orange salamander only in the vicinity of Camp Ledgewood in the Park. There it is found in seepage areas and along a branch of Boston Run. This low frequency is what one would expect, however, because the species has a very spotty distribution throughout northeastern Ohio.

LOCALITIES: Fig. 8. Off bike trail (old railroad grade) in seepage area among boulders at northern edge of Camp Ledgewood; off Akron-Peninsula Rd.; Boston Run, Camp Ledgewood.

CURRENT STATUS: Uncommon.

Red Salamander, Pseudotriton ruber ruber

Like the Long-tailed Salamander, the Red Salamander has been collected at only a few sites in the CVNRA. This relatively low frequency in the Park also reflects its status in northeastern Ohio.

LOCALITIES: Fig. 9. Along Ritchie Run by Truxell Rd. at the Octagon; Ice Box Trail, Ritchie Ledges; north fork of Boston Run, Camp Ledgewood; along Hemlock Trail, Ritchie Ledges.

CURRENT STATUS: Uncommon.

ORDER: Salientia

FAMILY: Bufonidae

American Toad, Bufo americanus americanus

This extremely abundant amphibian is found throughout the Park and can be heard calling from its breeding ponds in spring and early

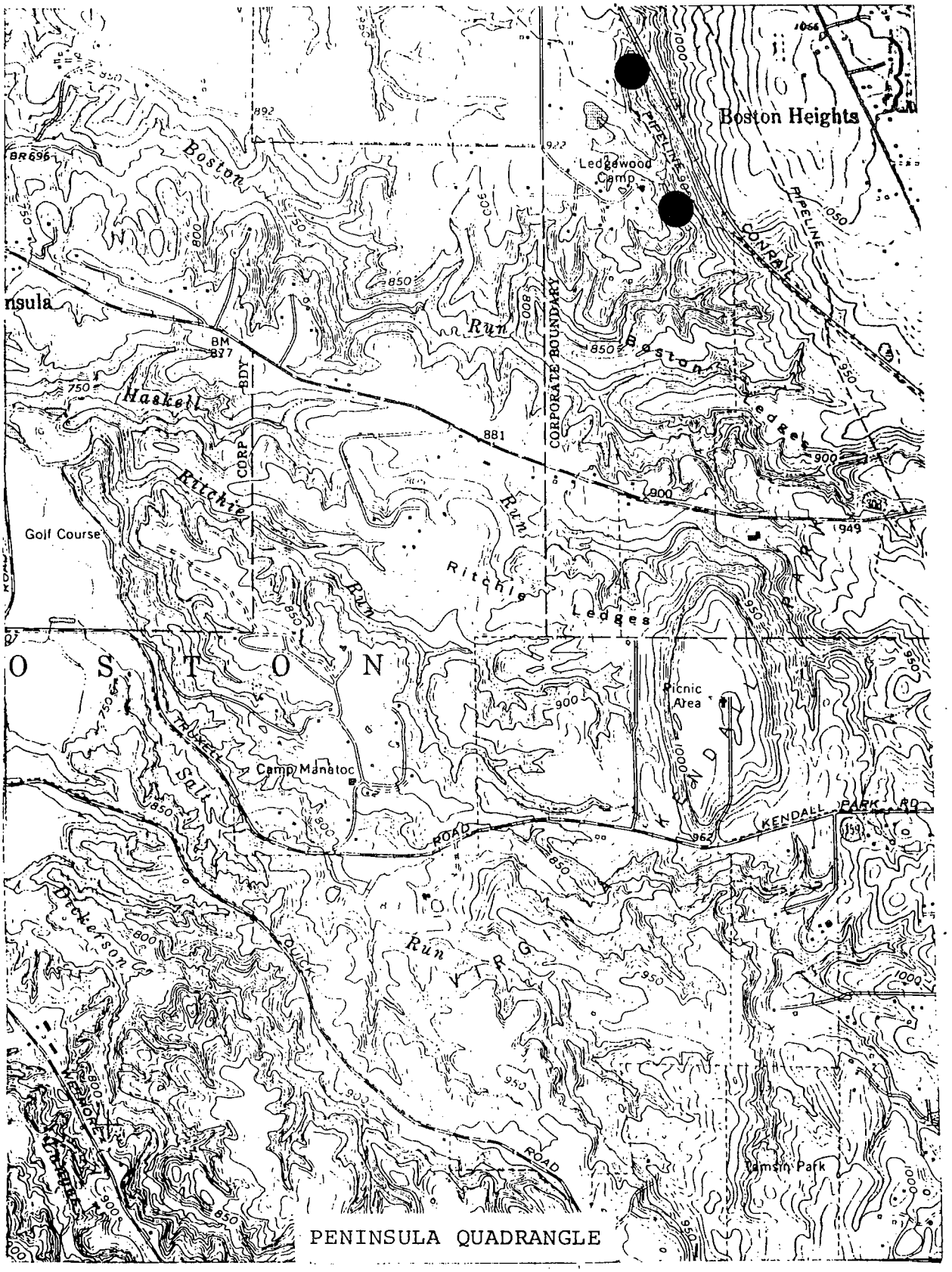


Fig. 8. Collecting sites for Long-tailed Salamanders.

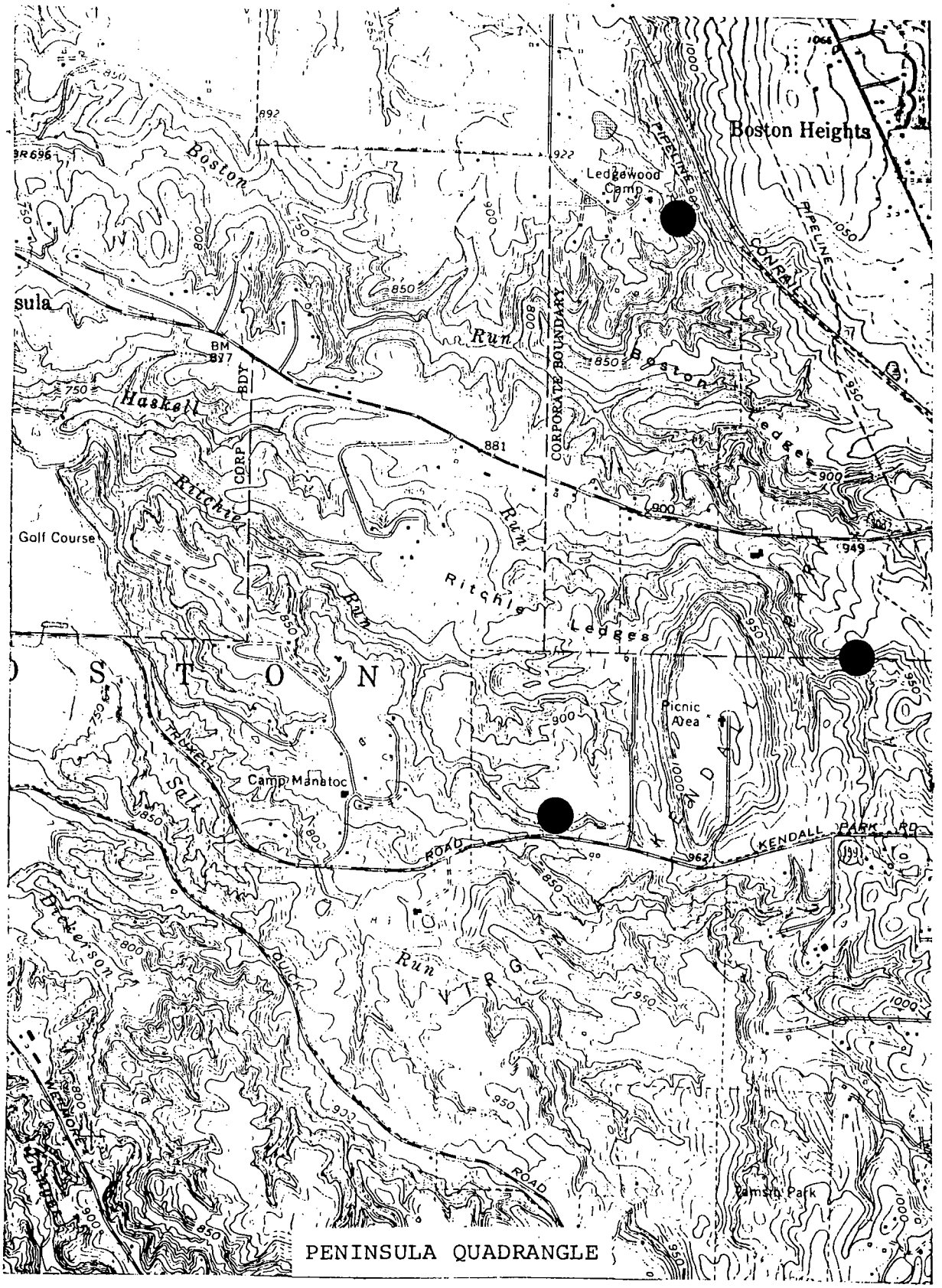


Fig. 9. Collecting sites for Red Salamanders.

summer. As mentioned elsewhere (Orr, 1978), MacLaren's report (1959) of the Southern Toad, Bufo terrestris in Kendall Park was undoubtedly an error.

LOCALITIES: Figs. 10a, 10b, 10c. Off Boston Mills Rd. between I-271 and Turnpike; north of Hilside Rd. at Cuyahoga River; north of Wheatley Rd. on Lucas Tract (111-14); beside pond 0.75 mile north of Jaite between railroad and Cuyahoga River; north of Peninsula on Akron-Peninsula Rd.; Truxell Rd., Kendall Park; beside pond at Oakhill Rd.-Wheatley Rd. intersection; Ice Box Trail, Ritchie Ledges; along Furnace Run; Majors Rd.; oxbow pond near Ira Rd.-Riverview Rd. intersection.

CURRENT STATUS: COMMON.

FAMILY: Hylidae

Peeper Tree Frog, Hyla crucifer crucifer

This diminutive frog can be heard calling in early spring from virtually every temporary pool or pond in the Park and is far more abundant than is indicated on Fig. 11. Because of its abundance, efforts were not made to add additional collection sites to those already recorded.

LOCALITIES: Fig. 11. Calling in April from many temporary pools along Riverview and Akron-Peninsula Rd.; swamp east of entrance to Kendall Lake off Truxell Rd.; West Forest Trail, Octagon, Kendall Park.

CURRENT STATUS: Common.

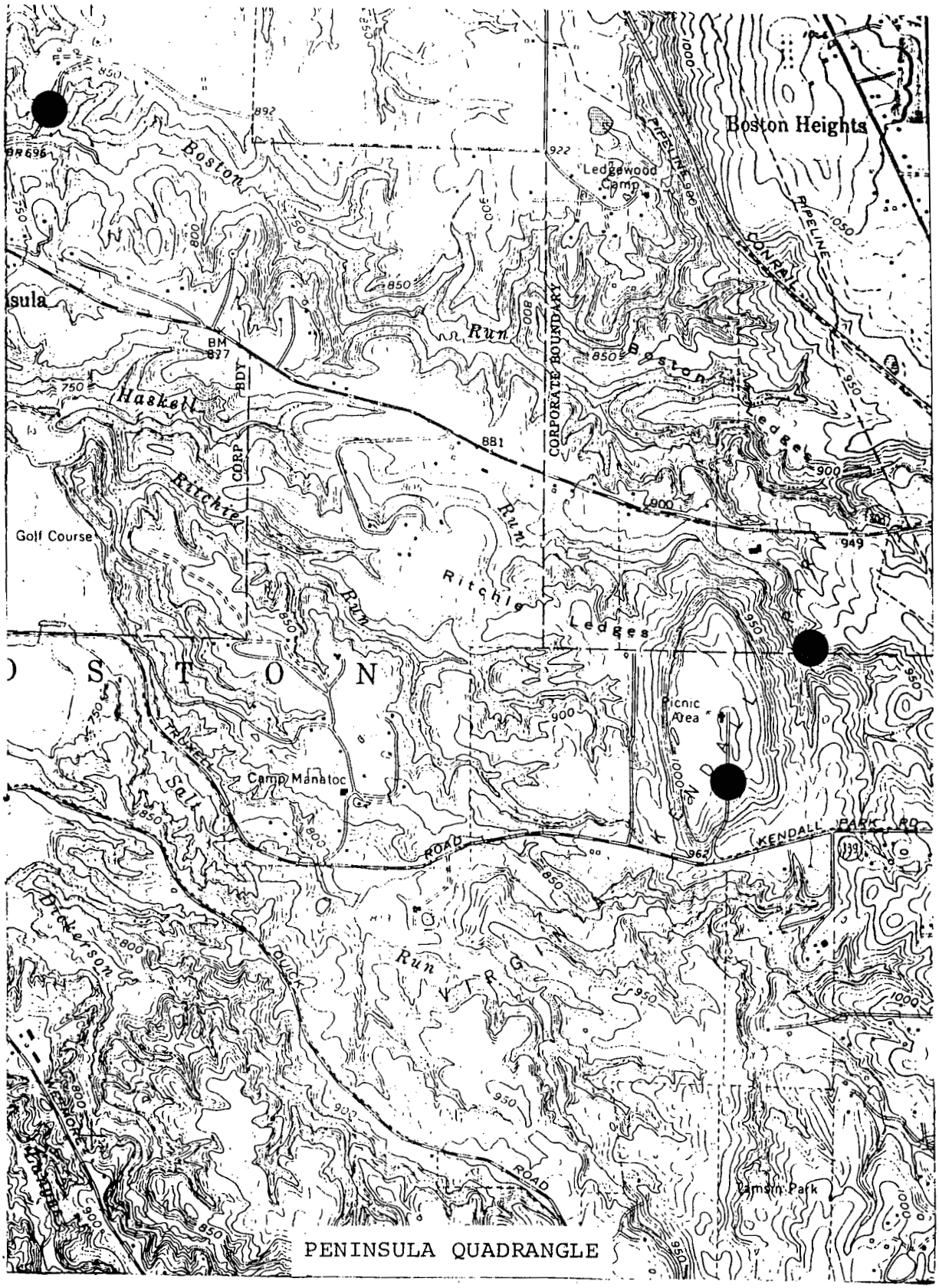


Fig. 10a. Collection sites for American Toads.

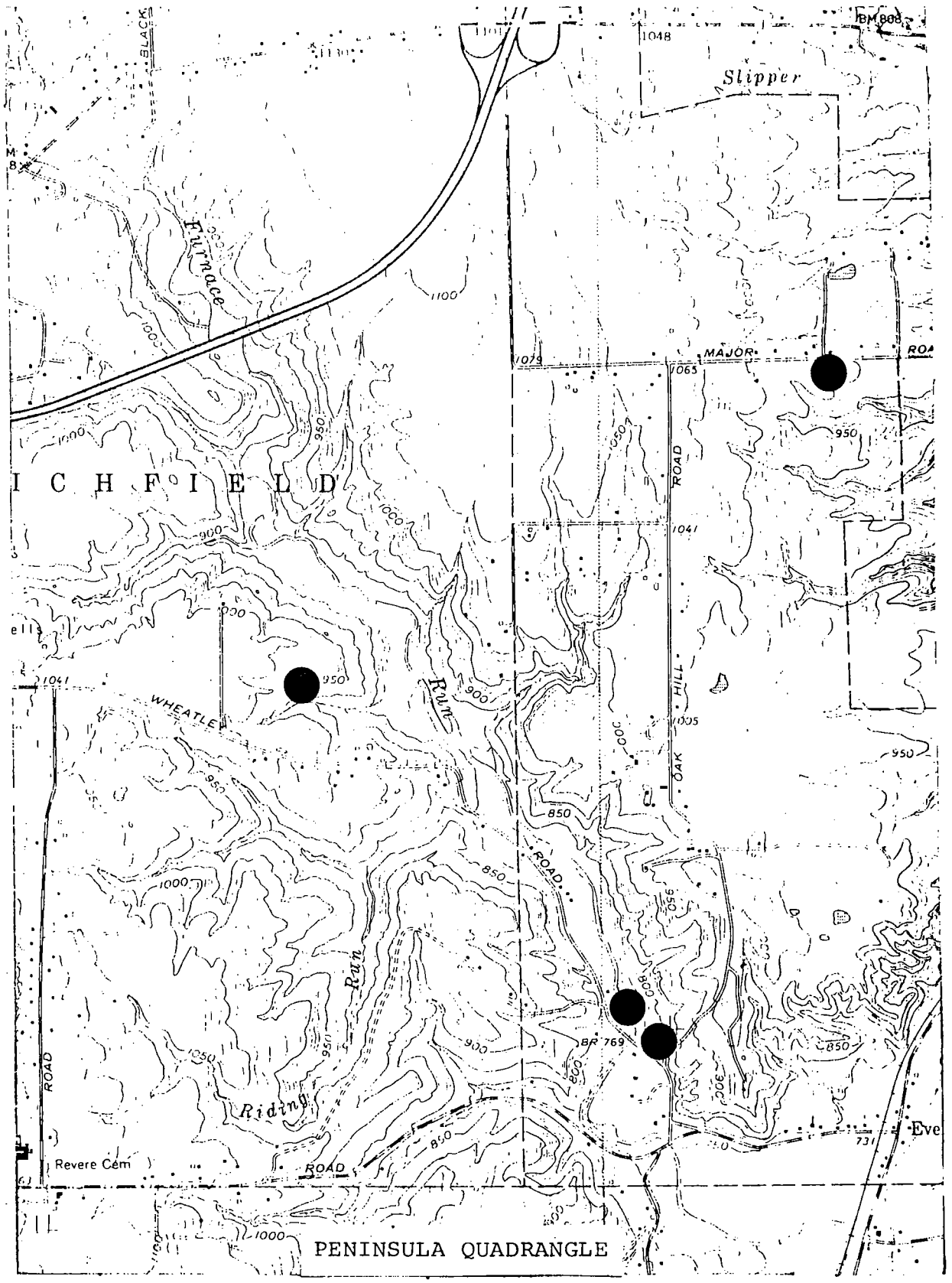


Fig. 10b. Collection sites for American Toads (continued).

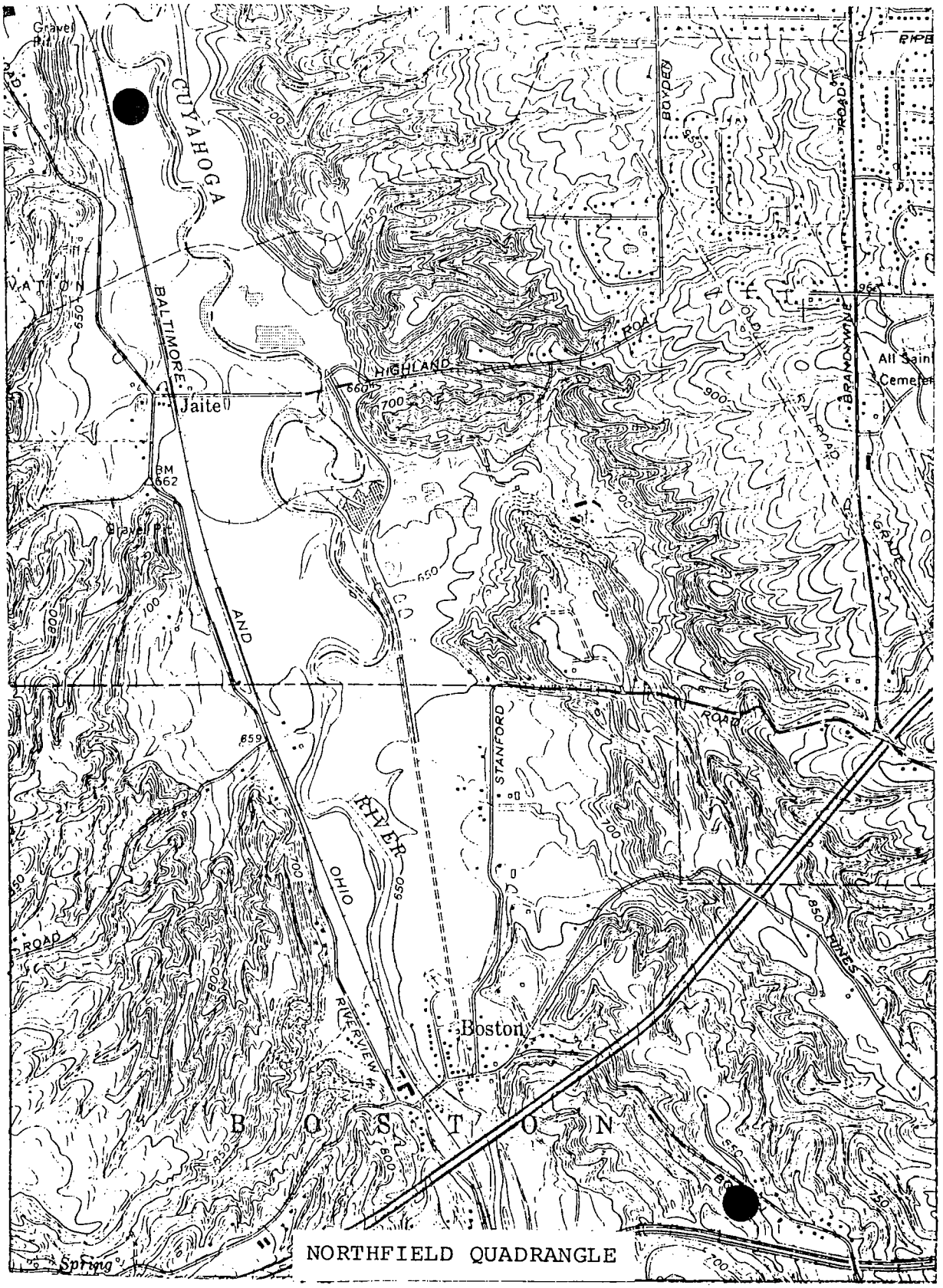


Fig. 10c. Collection sites for American Toads (continued).

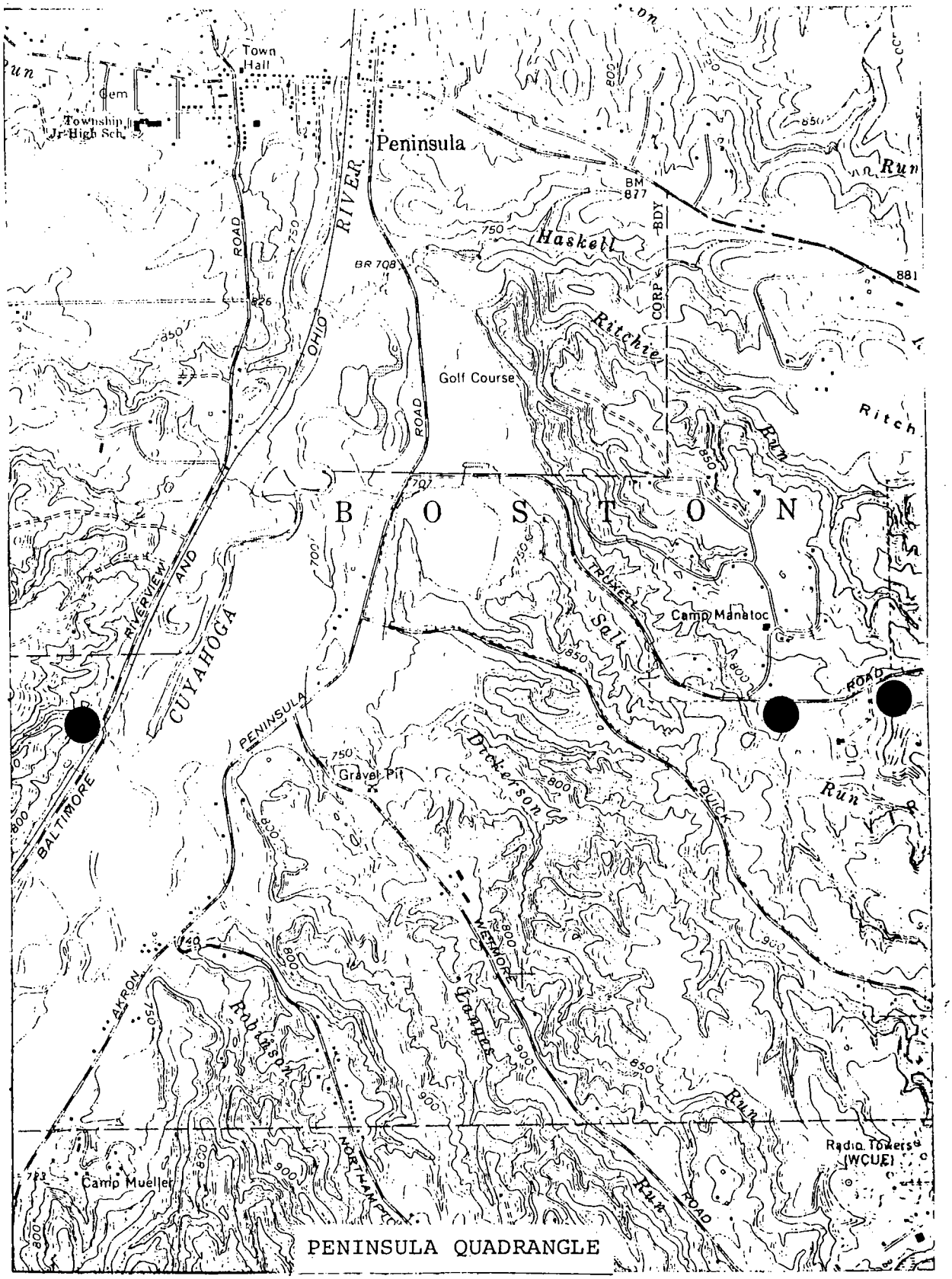


Fig. 11. Collection sites for Peeper Tree Frogs.

Greater Gray Treefrog, Hyla versicolor

This species is common in the wooded wetlands of the Park where it can be heard calling on damp summer evenings. Like many cryptic species, however, it may be overlooked if the correct habitat is not visited at the right time.

LOCALITIES: Figs. 12a, 12b, and 12c. Swamp east of road leading to Kendall Lake off Truxell Rd.; Merkle Pond on Riverview Rd. 0.3 mile north of Columbia Rd.; swamp on east side of Riverview Rd. 0.3 mile north of Everett Rd.

CURRENT STATUS: Common.

Northern Chorus Frog, Pseudacris triseriata triseriata

Extensive collecting efforts produced only a few populations of this hylid frog. Where populations were located, the Chorus Frogs were with the much more abundant Peeper Treefrogs in breeding ponds. Additional collecting in the early spring will undoubtedly produce more records but it clearly is not a common species.

LOCALITIES: Fig 13. In swamp by Riverview Rd. south of Peninsula and 0.6 mile south of railroad crossing on Riverview Rd.; in swamp on east side of Riverview Rd. 0.3 mile north of Everett Rd.

CURRENT STATUS: Uncommon.

FAMILY: Ranidae

Pickerel Frog, Rana palustris

This common northeastern Ohio frog was not collected as

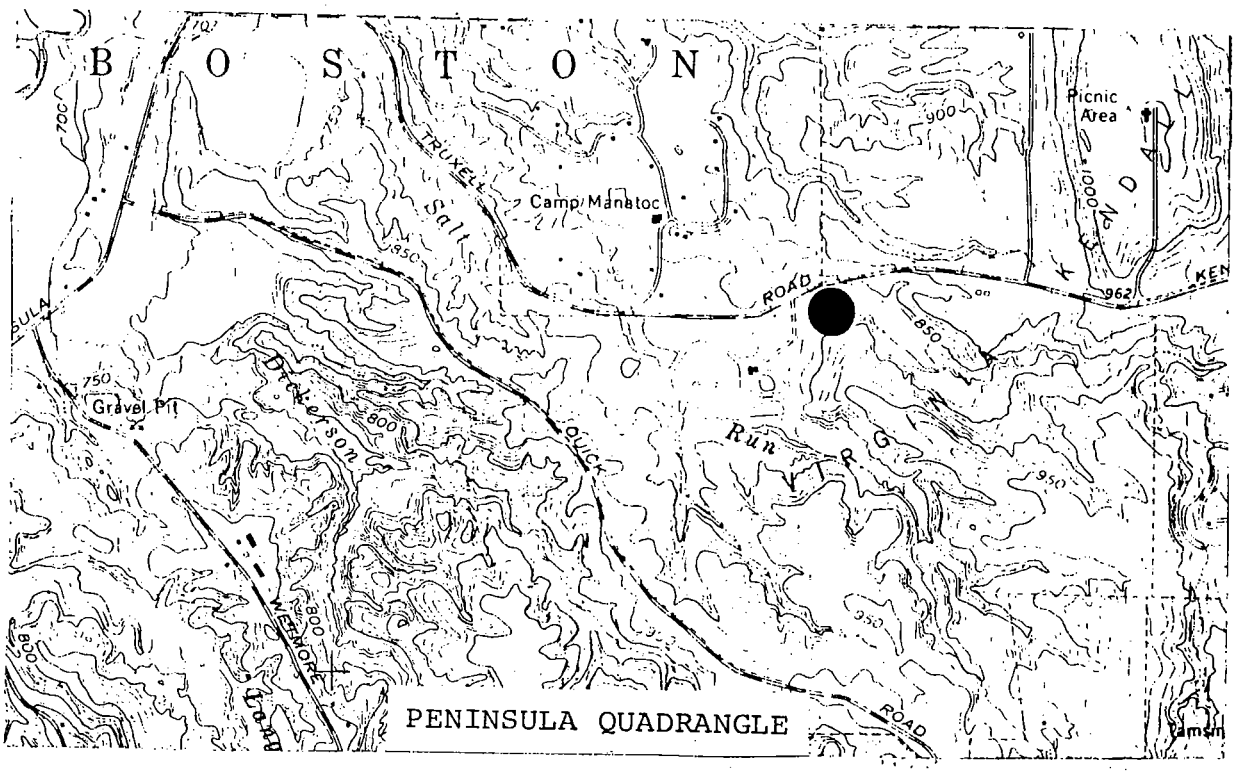


Fig. 12a. Collection site for Greater Gray Treefrog.

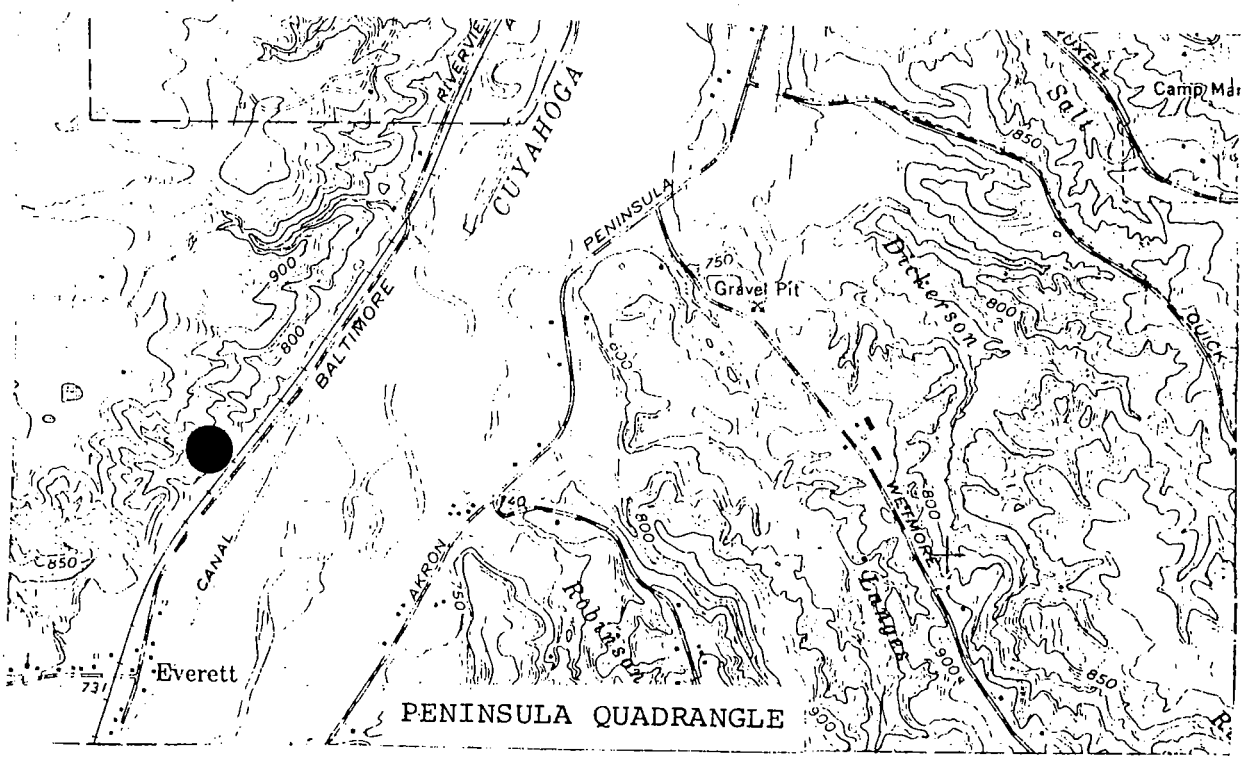


Fig. 12b. Collection site for Greater Gray Treefrog (continued).

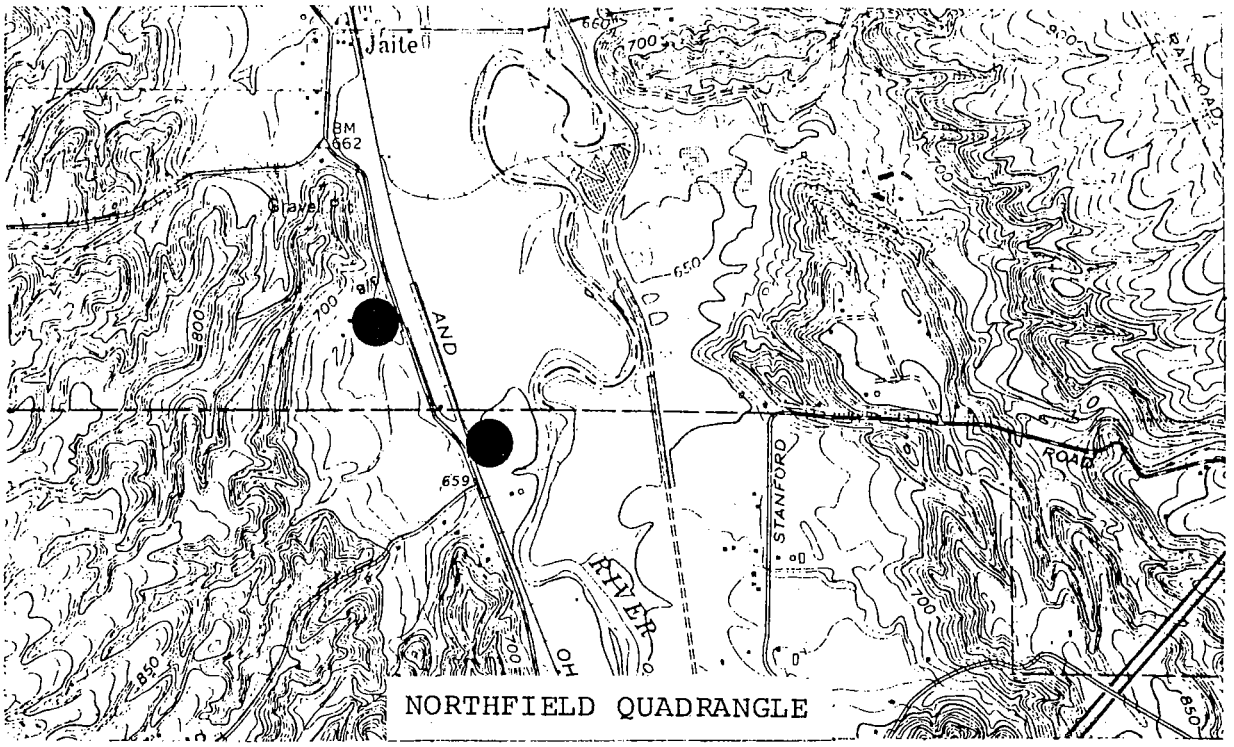


Fig. 12c. Collection sites for Greater Gray Treefrogs (continued).

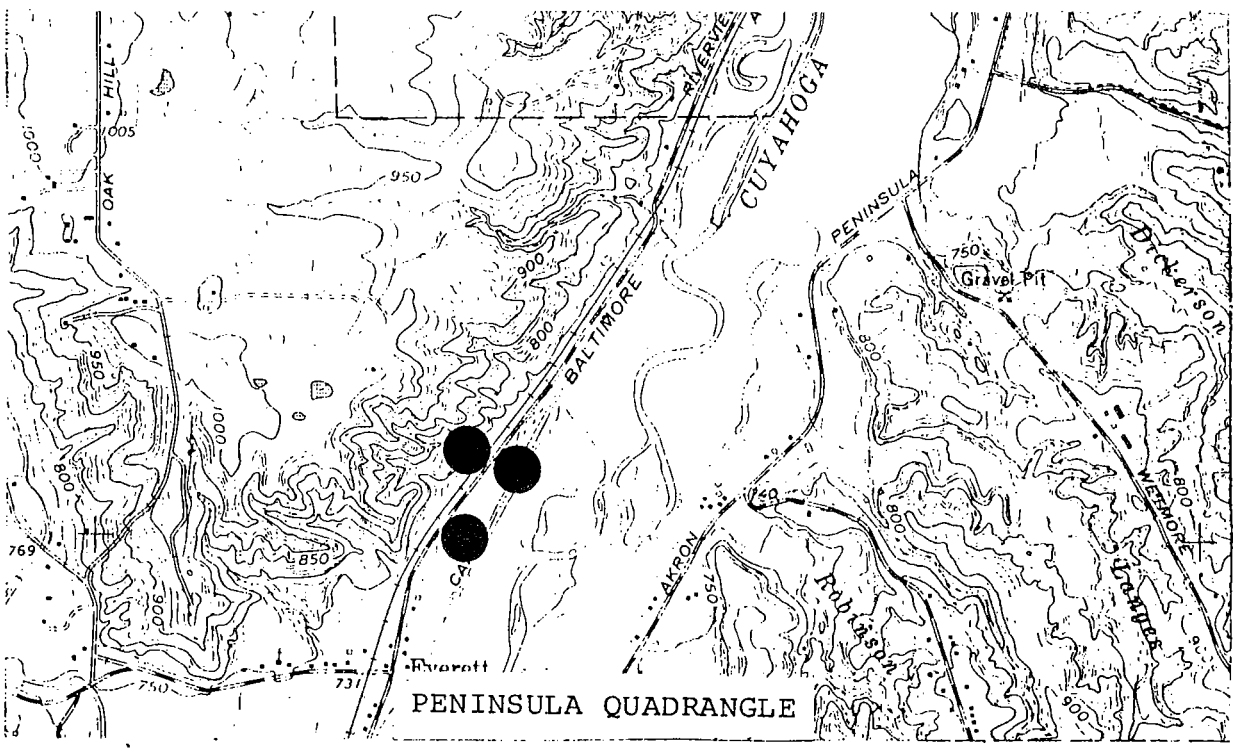


Fig. 13. Collection sites for Northern Chorus Frogs.

frequently as we expected in the Park. Additional collecting in the vicinity of cool water habitats will undoubtedly produce many more records in the future.

LOCALITIES: Fig. 14. Southwest of Hines Hill Rd. at I-271 along unnamed stream; along Boston Run at Camp Ledgewood off Akron-Peninsula Rd.

CURRENT STATUS: Common.

Northern Leopard Frog, Rana pipiens pipiens

In spite of intensive collecting efforts and conversations with numerous area naturalists, we have been unable to collect this species or verify its collection in the Park. The only records we have for the Park were reported by MacLaren (1959) and Jack McCormick Associates (1974). Because neither of these individuals reported finding the relatively abundant and similar Pickerel Frog, we suspect they may have misidentified Pickerel Frogs as Leopard Frogs. Nevertheless, we are including it in the herpetofauna of the Park and will continue searching for it. It is interesting, however, that we have not collected this species in northeastern Ohio for the past 10 years although earlier reports (Dexter, 1955) indicate it was once abundant. It is a species which should be monitored closely to determine if its numbers are not declining.

LOCALITIES: Kendall Park.

CURRENT STATUS: Rare if present at all.

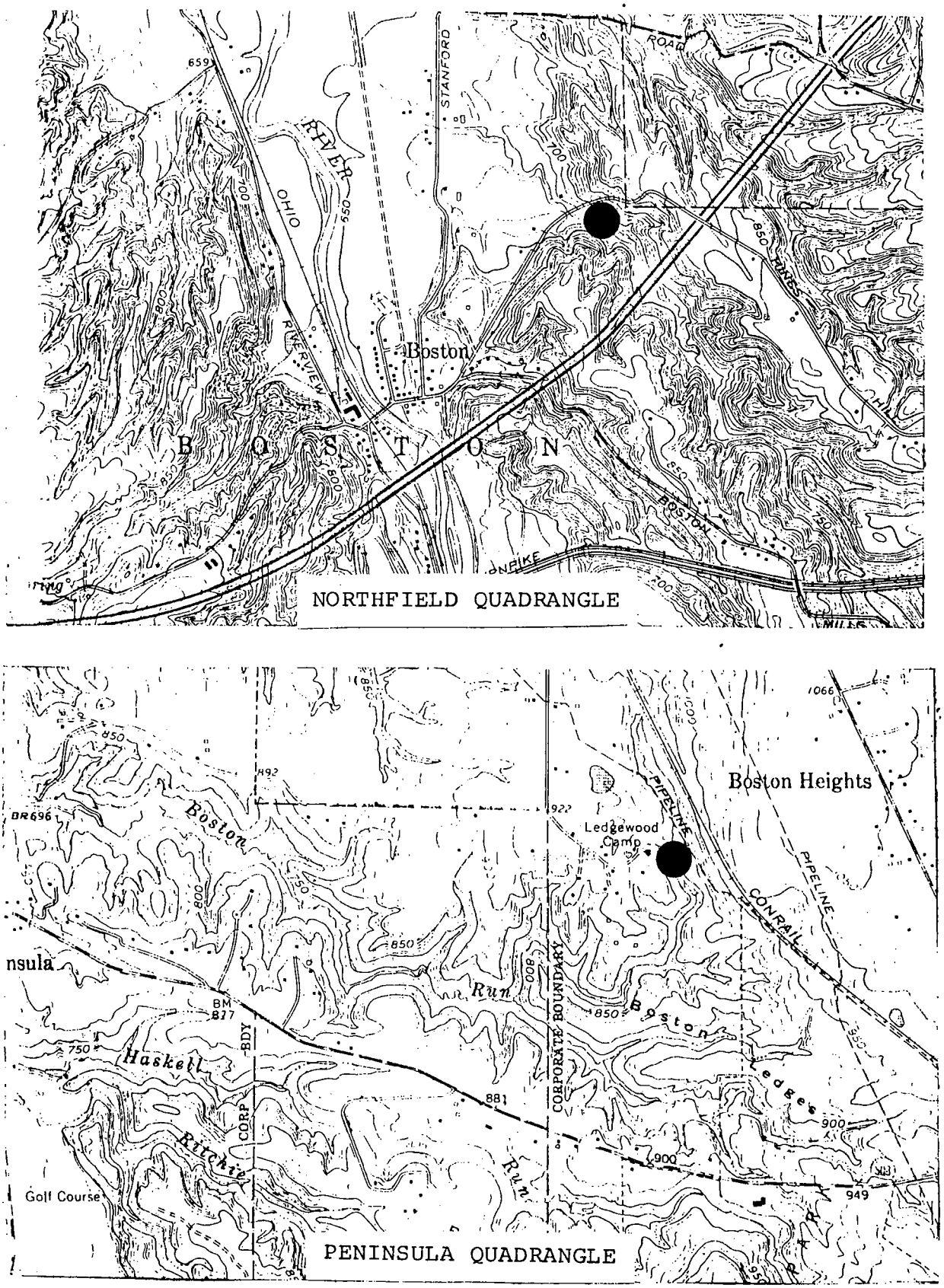


Fig. 14. Collection sites for Pickerel Frogs.

Green Frog, Rana clamitans melanota

This is the most abundant frog in the Park and is found around virtually every pond, lake, or stream in the Park.

LOCALITIES: Figs. 15a, 15b, and 15c. Along Robinson Run off Akron-Peninsula Rd.; in swamp at Stumpy Basin between Turnpike and Cuyahoga River; pond on Riverview Rd. 0.1 mile north of Columbia Rd.; swamp east of road leading to Kendall Lake off Truxell Rd.; Merkle Pond on Riverview Rd. 0.3 mile north of Columbia Rd.; two ponds on Hines Hill Rd. 0.1 mile west of Old Route 8; oxbow lake near Ira Rd.-Riverview Rd. intersection; Riverview Rd. south of Peninsula at railroad crossing; West Forest Trail, Octagon, Kendall Park; Furnace Run at Wheatley Rd.; Truxell Rd.; Hemlock Trail, Ritchie Ledges; Akron-Peninsula Rd. north of Peninsula; Ice Box Trail, Ritchie Ledges.

CURRENT STATUS: Common.

Wood Frog, Rana sylvatica

The relatively few locality records for this woodland species in the Park undoubtedly do not accurately reflect its numbers or distribution in the Park. Intensified night collecting efforts in early spring when the species is breeding undoubtedly would indicate that it is much more abundant than our data indicate.

LOCALITIES: Fig. 16. Road off Truxell Rd. leading to the Octagon; along Ritchie Run near Truxell Rd. at the Octagon.

CURRENT STATUS: Common.

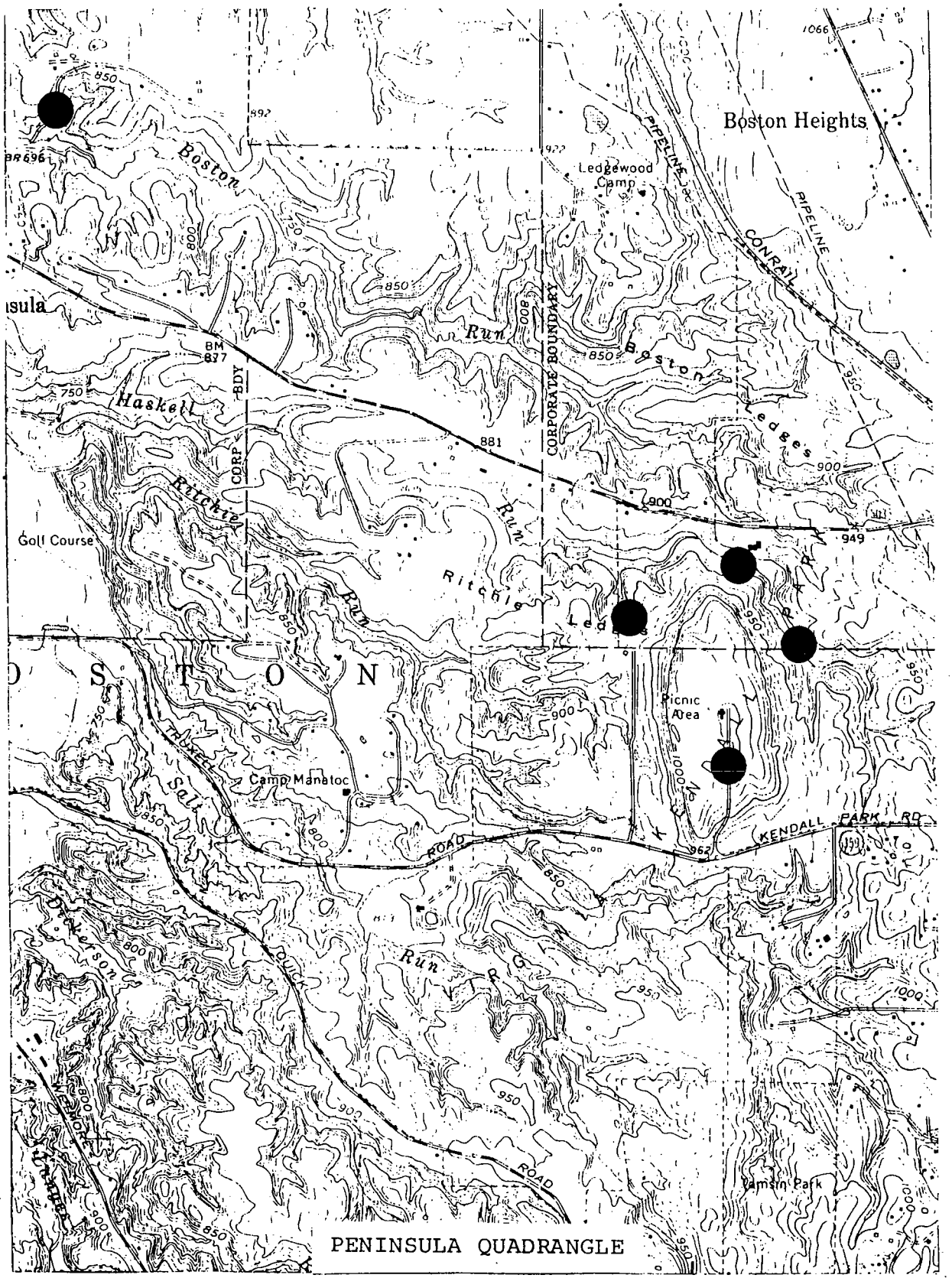


Fig. 15a. Collection sites for Green Frogs.

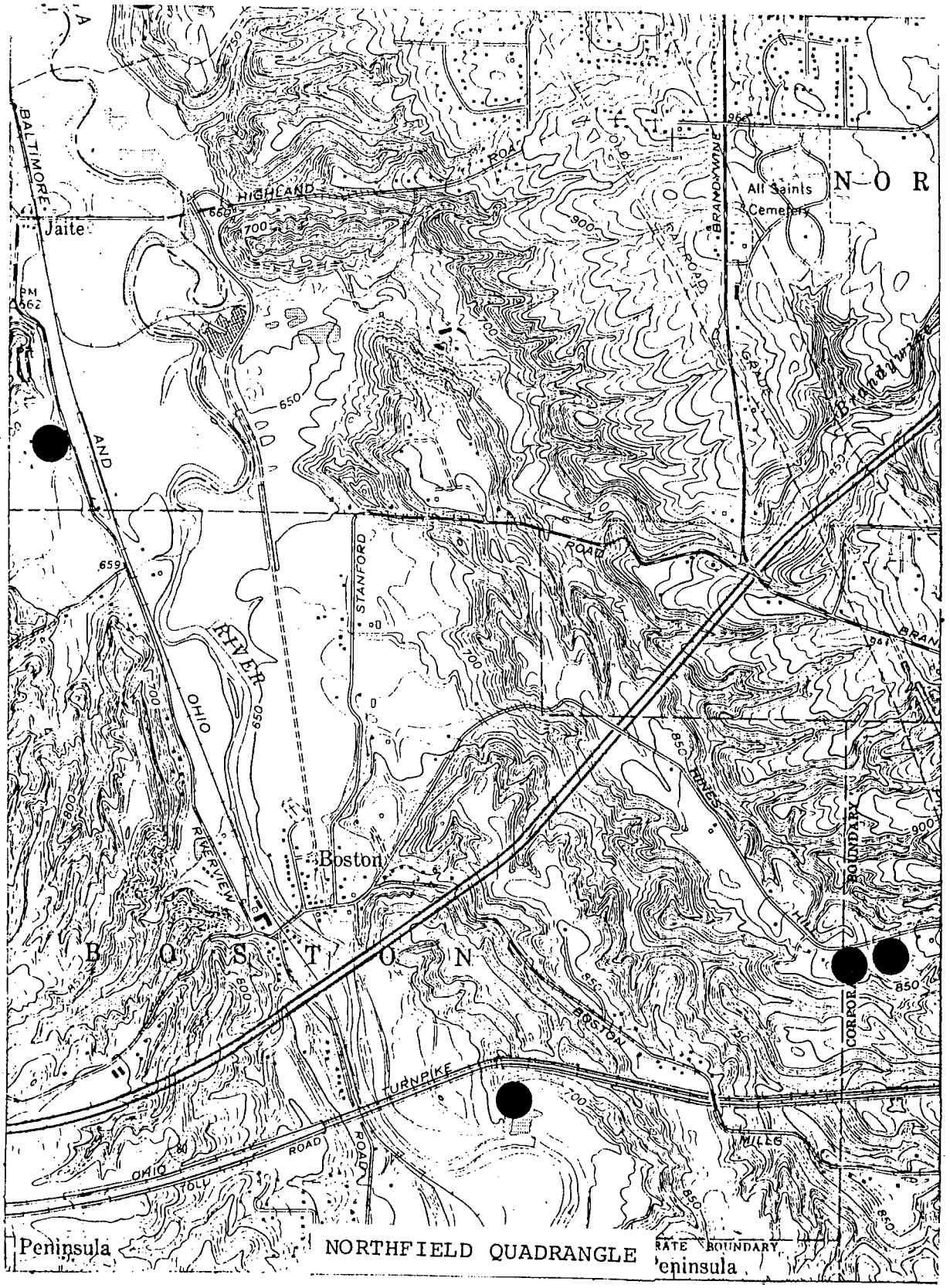


Fig. 15b. Collection sites for Green Frogs (continued).

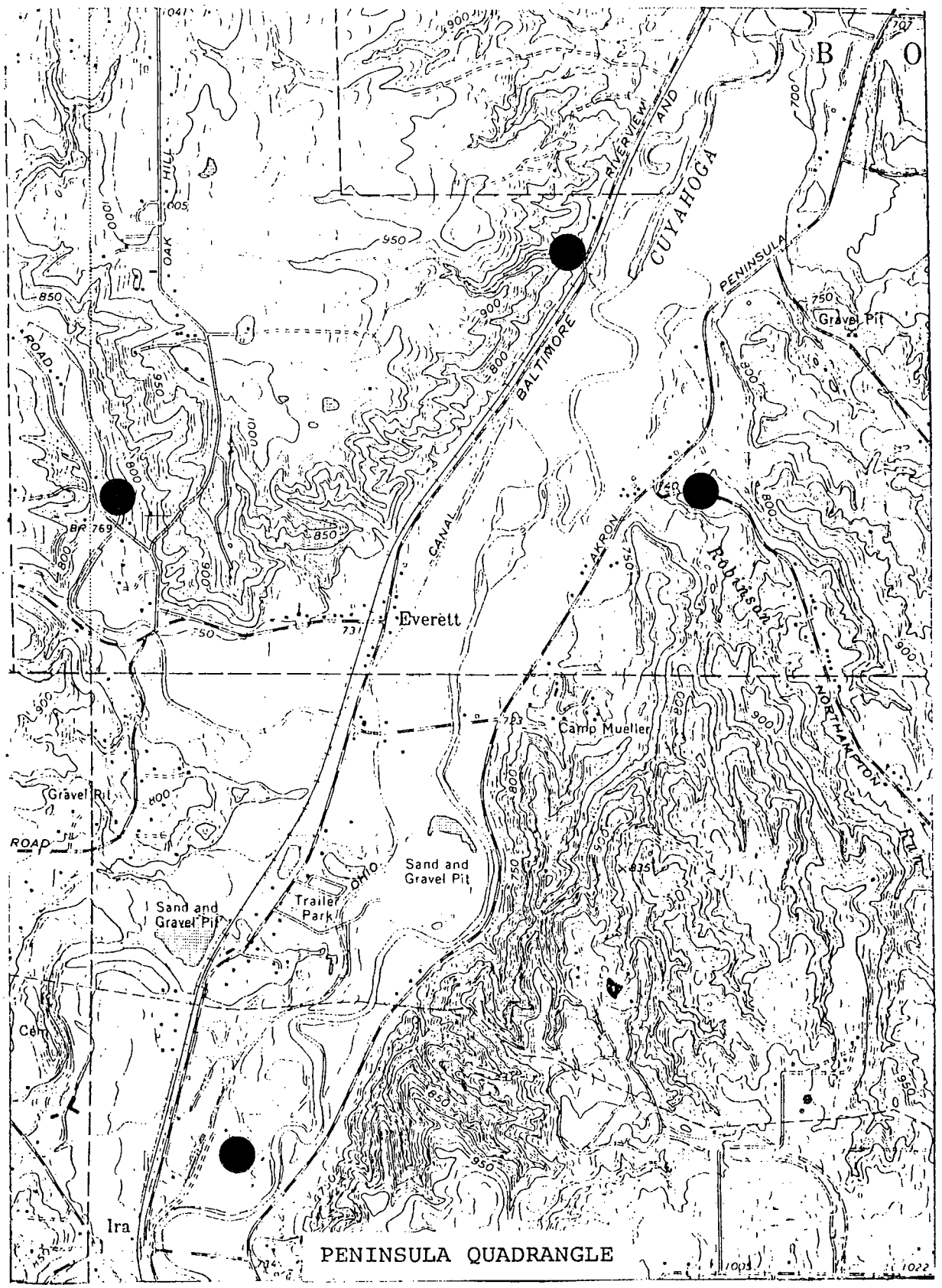


Fig. 15c. Collection sites for Green Frogs (continued).

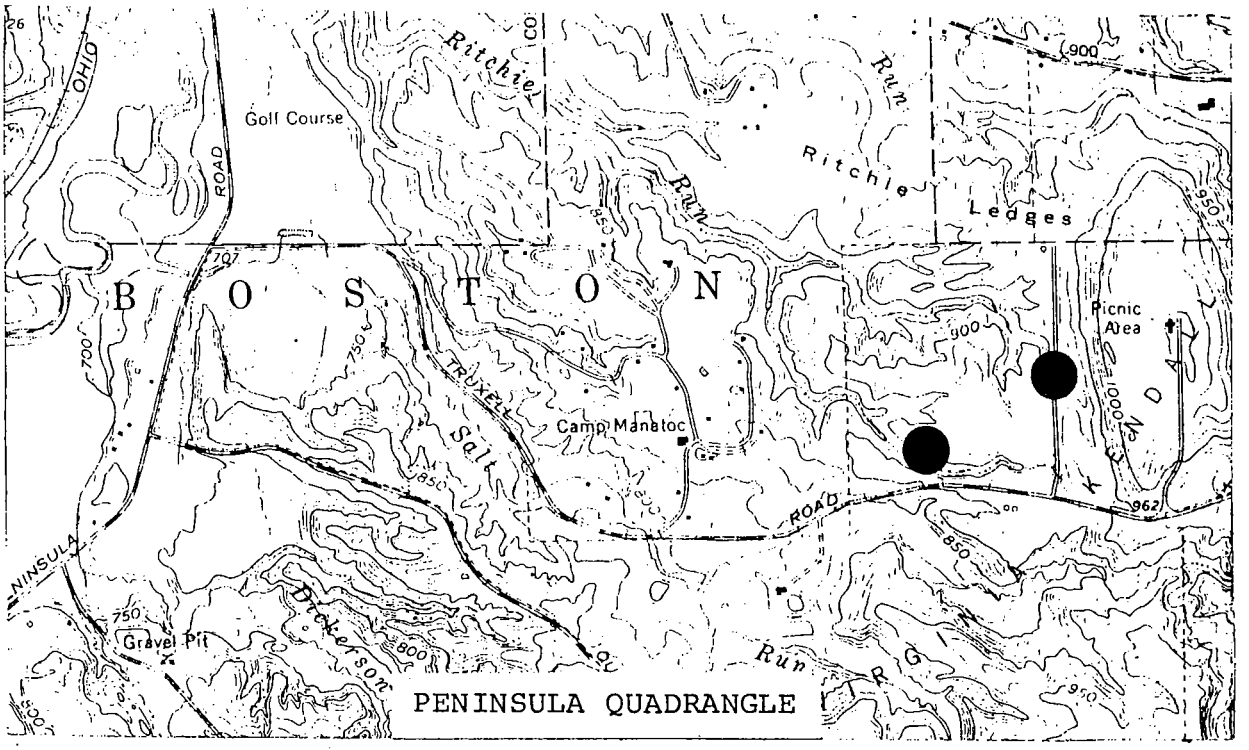


Fig. 16. Collection sites for Wood Frogs.

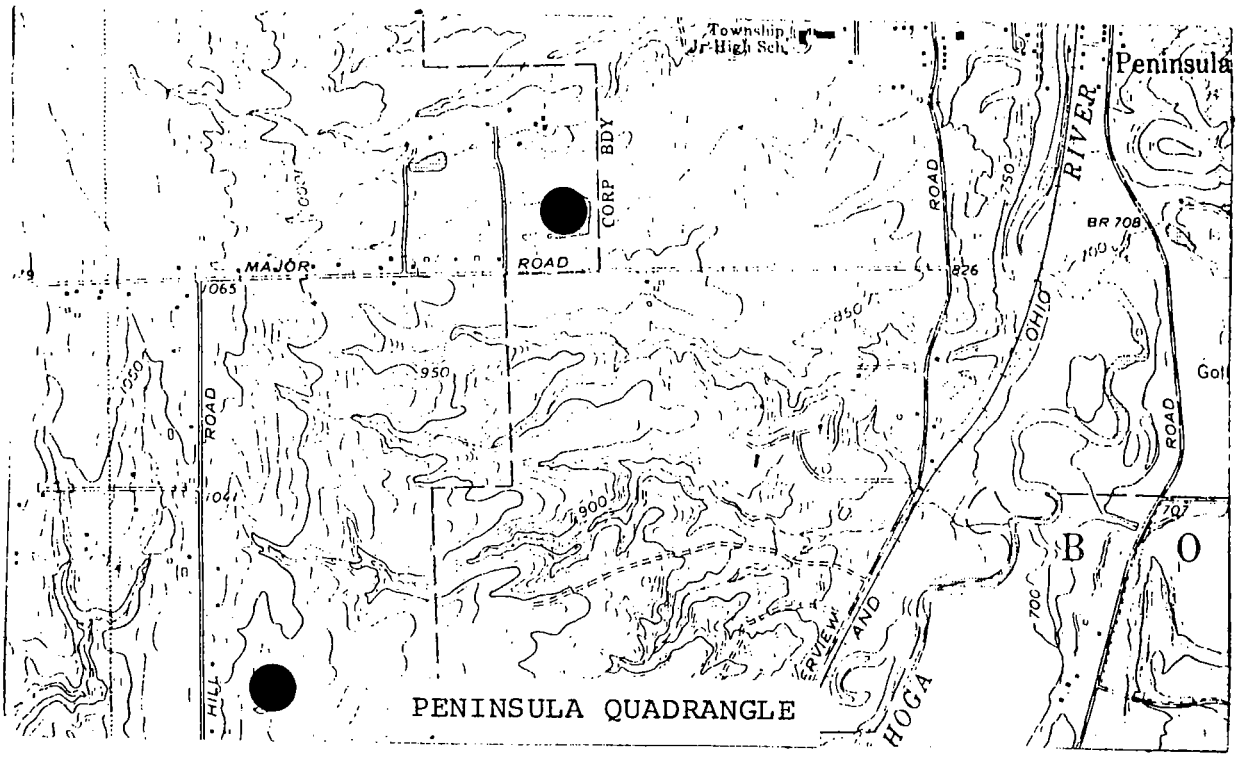


Fig. 17a. Collection sites for Bullfrogs.

Bullfrog, Rana catesbyiana

Through night collecting around the many farm ponds in the Park, we were able to increase the number of localities for this abundant Anuran. We found no large populations at any locality but collecting on warm moist summer evenings after dusk indicated that this species is well established in the CVNRA.

LOCALITIES: Figs. 17a-17d. Kendall Lake off Truxell Rd.; beside Ohio and Erie Canal off Alexander Rd.; Merkle Pond on Riverview Rd 0.3 mile north of Columbia Rd.; in Ohio and Erie Canal where Ira Rd. intersects Riverview Rd.; in pond off Hines Hill Rd. 0.9 mile west of old Route 8; Horseshoe Pond on Major Rd. 0.8 mile west of Riverview Rd.; oxbow lake near Ira Rd.-Riverview Rd. intersection.

CURRENT STATUS: Common.

Reptiles

Field studies in this survey coupled with literature and museum records have produced a reptile inventory for the CVNRA that includes 6 turtle species and 11 snake species. No lizard records have been authenticated for the Park. Also, no venomous snakes have been reported. This survey has added the Stinkpot Turtle to the pre-existing list produced by Orr (1978, 1980) and has added locality records for the Smooth Green Snake and the Red-eared Turtle, two rare species that have been classified as "Special Animals" by the Ohio Natural Heritage Program. The Spotted Turtle, an endangered species, is also included in the inventory. This study has added new locality data for seven reptile species. A complete inventory for reptiles in

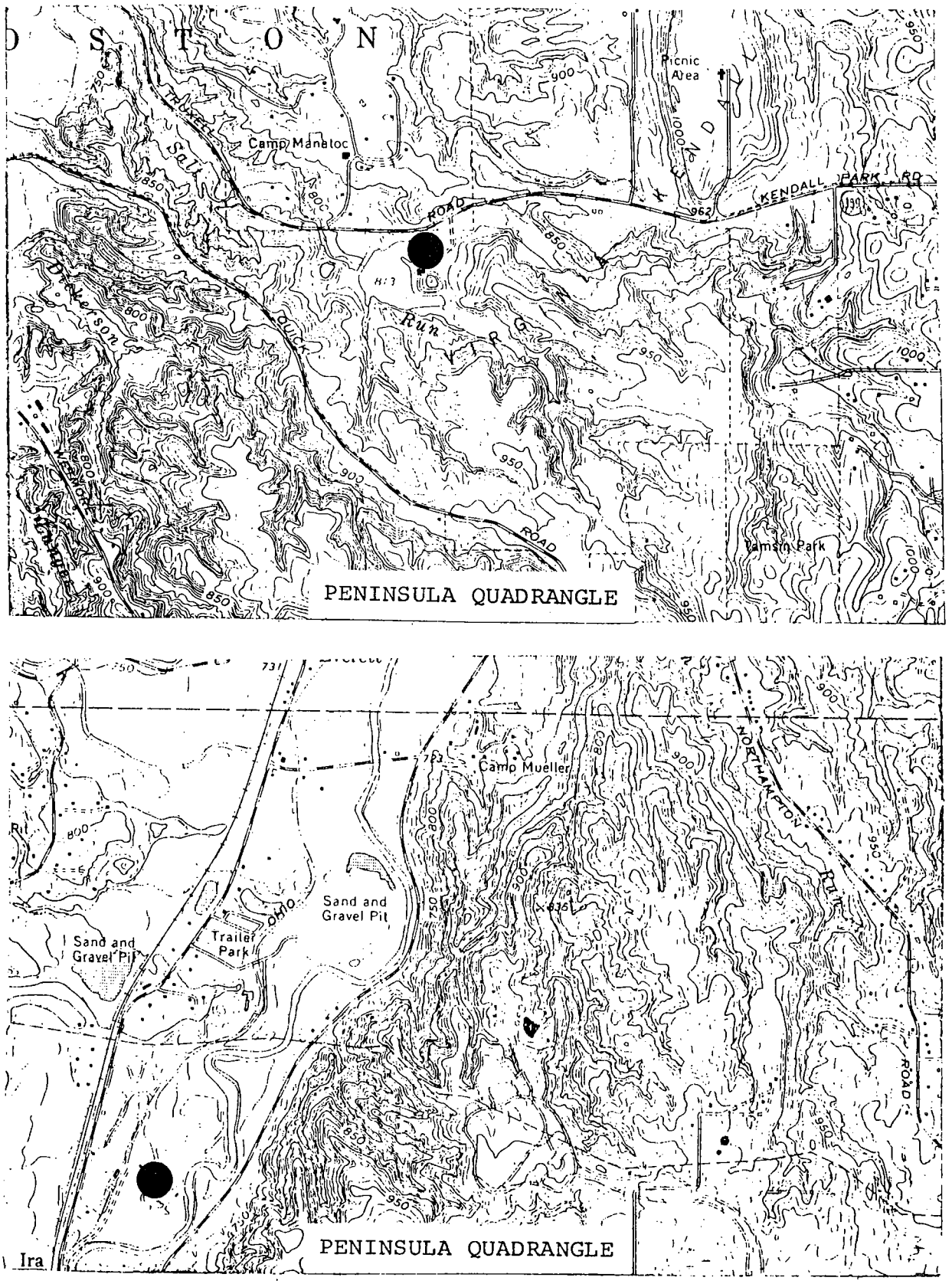


Fig. 17b. Collection sites for Bullfrogs (continued).

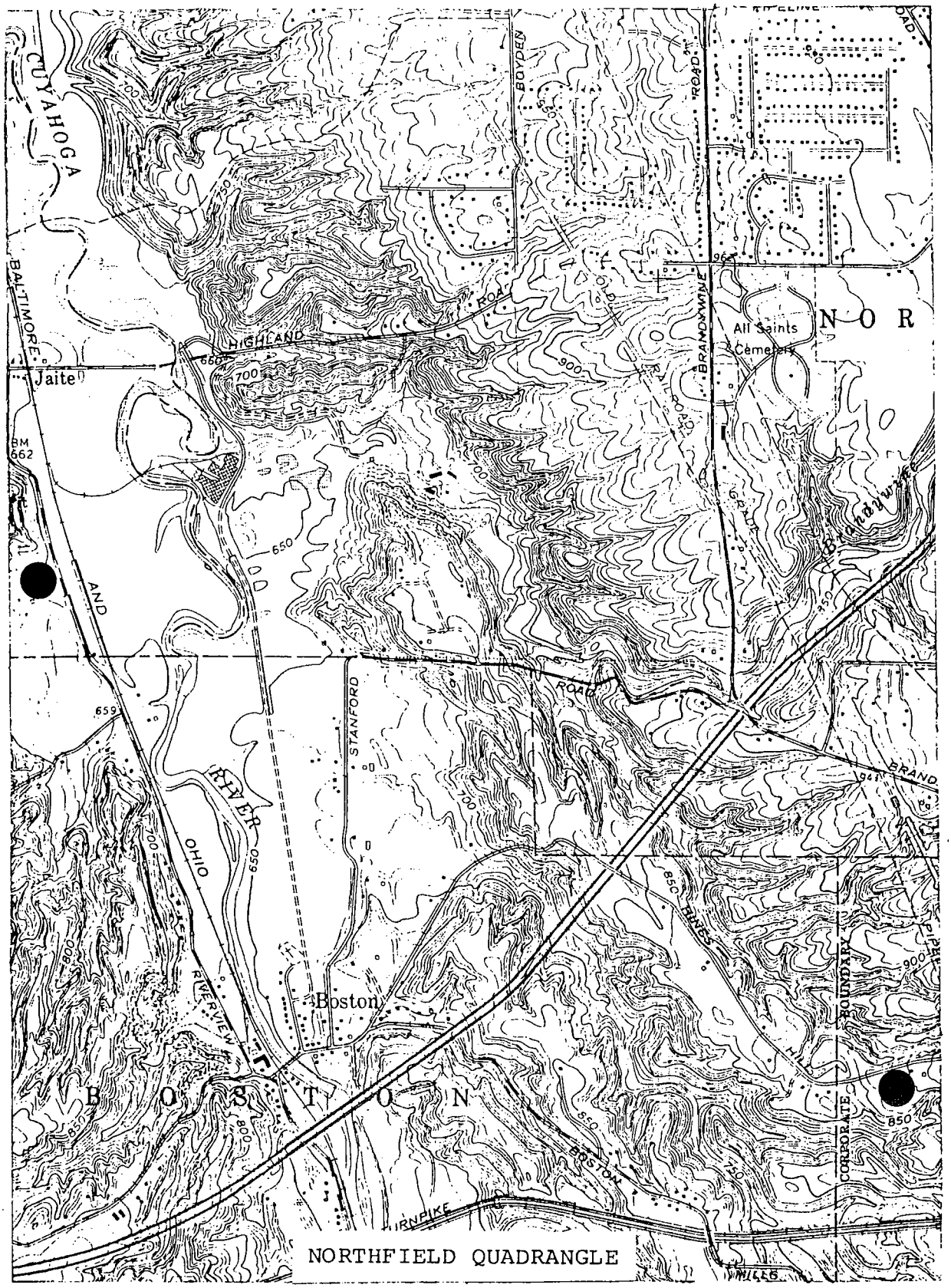


Fig. 17c. Collection sites for Bullfrogs (continued).

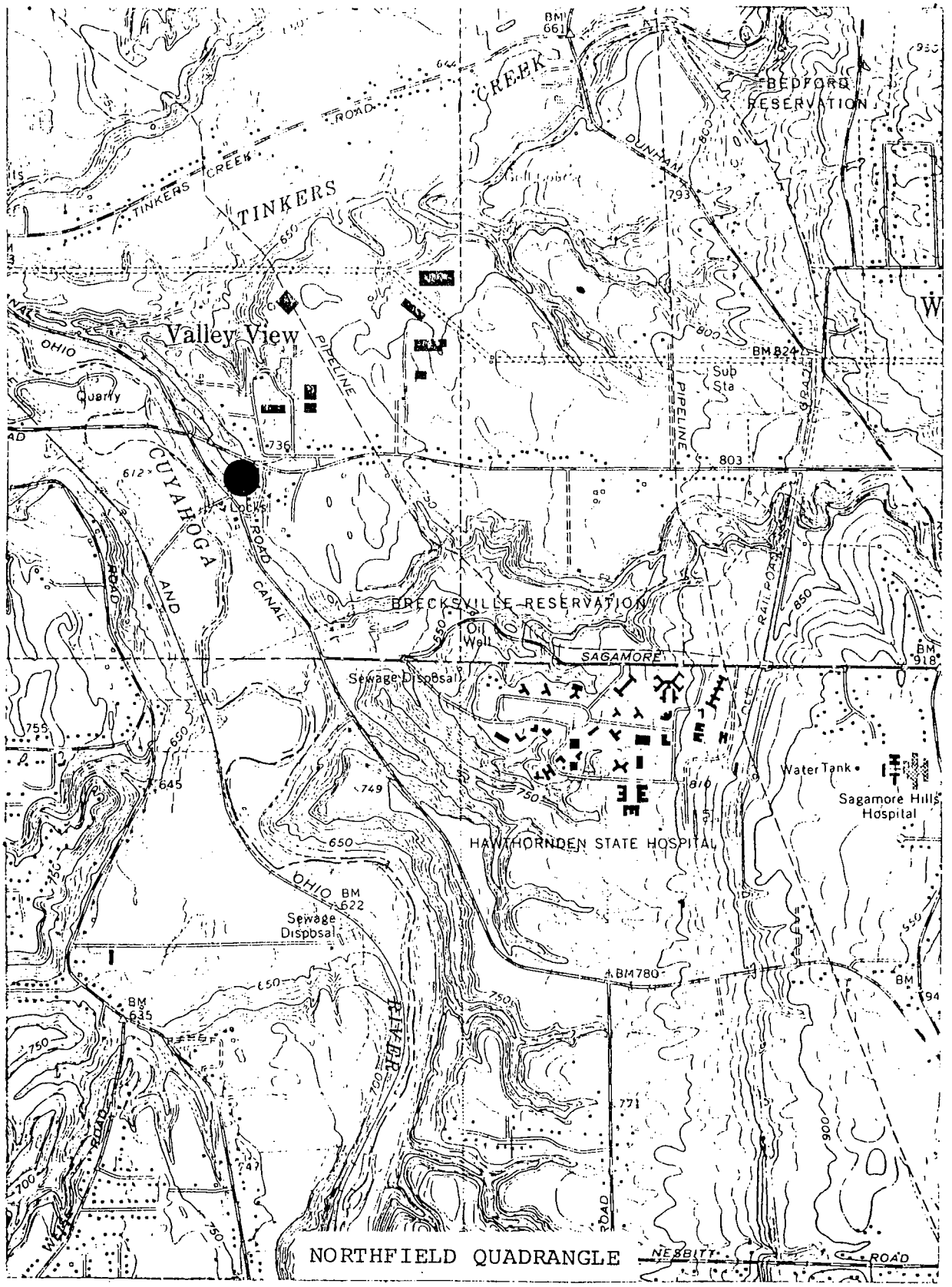


Fig. 17d. Collection site for Bullfrogs (continued).

TABLE 2. Reptiles known to occur in the Cuyahoga Valley National Recreation Area. Breeding habitats are underlined and preferred habitats are indicated with an asterisk (*). Numbers in parentheses identify habitats on an existing CVNRA Vegetation Study Map. A cross (+) indicates species observed by project investigators and an (E) indicates an endangered species in Ohio.

SPECIES	Maple-Sycamore Forest (1)	Oak-Beech-Maple Forest (2+5)	Hemlock-Beech Forest (3)	Oak-Hickory Forest (4)	Barren Land (12)	Scrub-Oldfield (6)	Wet Meadow (7)	Cultivated-Suburban Land (8+9)	Pine-Spruce Forest (11)	Swamp	Ponds and Lake	Stream-Stream Edge
Common Snapping Turtle +						x	x			x*	x*	x
Red-eared Turtle +						x	x			x	x*	x
Stinkpot Turtle +							x			x	x*	x
Eastern Box Turtle +	x*	x	x	x		x	x	x	x	x		
Painted Turtle +							x			x*	x*	x
Spotted Turtle (E)+							x			x*	x	x
Brown Snake +	x*	x	x			x	x	x		x		
Redbelly Snake +	x*	x	x				x*	x		x		
Northern Water Snake +										x*	x*	x*
Common Garter Snake +	x*	x	x	x		x	x*	x	x	x		

TABLE 2 (Continued). Reptiles Known to occur in the CVNRA.

SPECIES	Maple-Sycamore Forest (1)	Oak-Beech-Maple Forest (2+5)	Hemlock-Beech Forest (3)	Oak-Hickory Forest (4)	Barren Land (12)	Scrub-Oldfield (6)	Wet Meadow (7)	Cultivated-Suburban Land (8+9)	Pine-Spruce Forest (11)	Swamp	Ponds and Lakes	Stream-Stream Edge
Eastern Ribbon Snake +	x	x	x				x*			x*	x	x
Eastern Ringneck Snake +	x	x*	x*	x*					x			
Eastern Racer +	x	x	x	x		x*		x	x			
Smooth Green Snake +						x*	x	x		x		
Milksnake +	x	x	x	x		x*		x	x			
Ratsnake +	x*	x	x	x		x		x	x			
Queen Snake										x	x	

the Park along with a description of their habitats is given in Table 2. Species accounts and distribution maps for reptiles are given below. The taxonomy used in Smith and Brodie (1982) is followed for all taxonomic designations.

ORDER: Testudines

FAMILY: Chelydridae

Common Snapping Turtle, Chelydra serpentina serpentina

Turtle traps placed in ponds and the Ohio and Erie Canal produced several new locality records for this common species. If time permitted, intensified collecting would undoubtedly indicate that Snapping Turtles are found in most of the ponds and lakes of the Park.

LOCALITIES: Fig. 18. In pond 0.4 mile northeast of Boston Mills-Turnpike intersection; oxbow pond between Cuyahoga River and Riverview Rd. near Ira Rd..-Riverview Rd. intersection; in Ohio and Erie Canal at Ira Rd.-Riverview Rd. intersection.

CURRENT STATUS: Common.

FAMILY: Emydidae

Red-eared Slider, Pseudemys scripta elegans

Because this species is commonly sold in the pet trade, one should therefore suspect that individual turtles collectedww well beyond their natural range were released after being purchased.

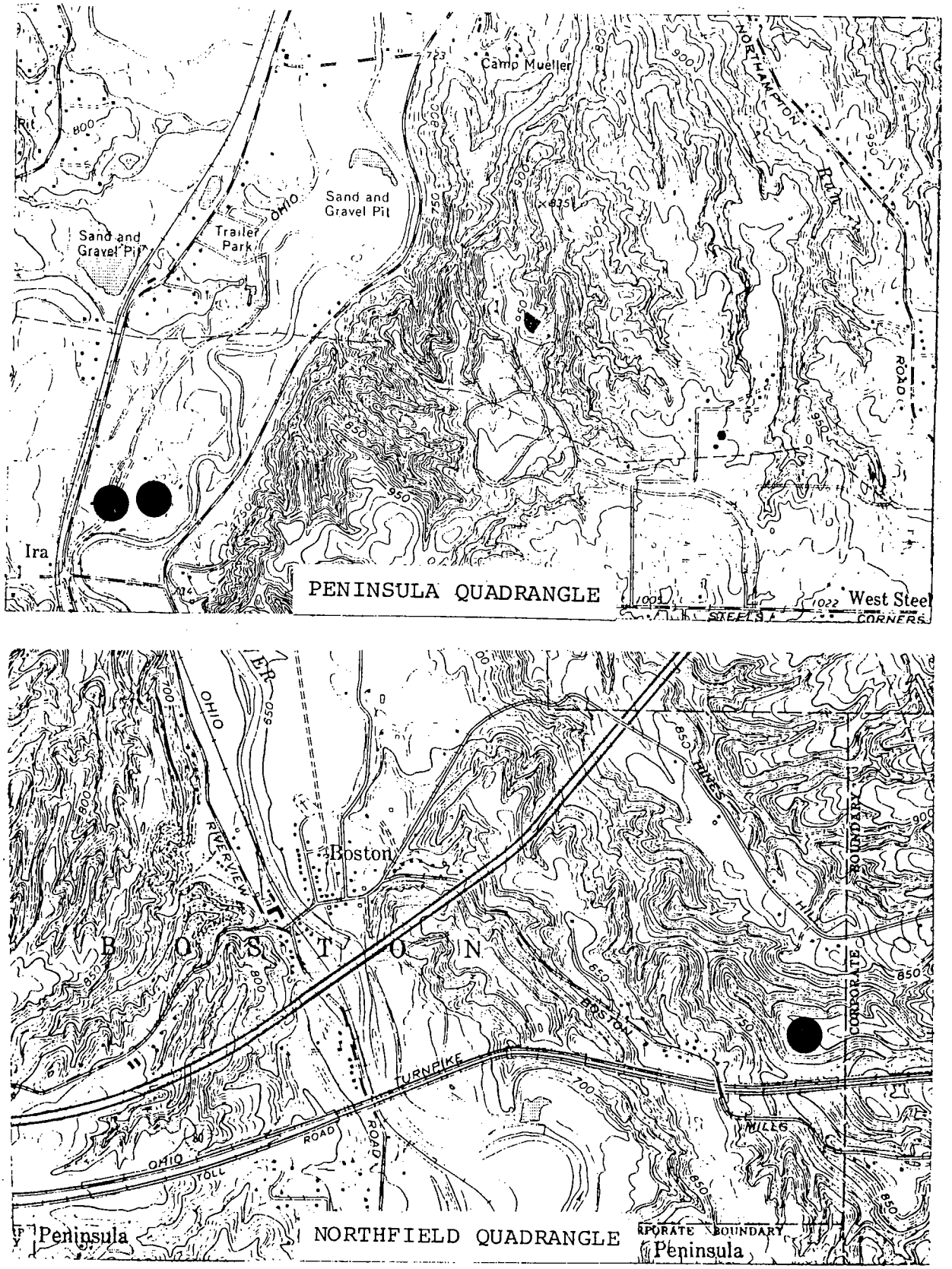


Fig. 18. Collection sites for Common Snapping Turtles.

However, those that are released may breed and establish new populations as they have in several counties in Michigan (Conant, 1951). We now have two records from the Park in our own field work and a third from Jack McCormick, Associates (1974) in their field studies. Both of our records were in the same vicinity of the Ira Rd. - Riverview Rd. intersection along or near the Cuyahoga River. This number of observations suggests that a population has become established, a theory that could be easily tested by searching and trapping this area thoroughly. If relatively large numbers of adults are found, one can be fairly certain that a breeding population has become established. Red-eared Sliders are uncommon in Ohio and have therefore been given a "Special Animal" designation by the Ohio Natural Heritage Program.

LOCALITIES: Fig. 19. Along Cuyahoga River approximately 1 mile north of Ira; caught in a trap in the oxbow pond by Cuyahoga River 0.3 mile northeast of Ira; no locality given, Jack McCormick, Associates (1974).

CURRENT STATUS: Rare.

FAMILY: Kinosternidae

Stinkpot Turtle, Sternotherus odoratus

Although many hours were spent in attempting to trap this species, we were able to obtain only one locality record for the Stinkpot in the Park and this consisted of the skeletal remains of an animal along the Ohio and Erie Canal. We feel, however, that additional trapping

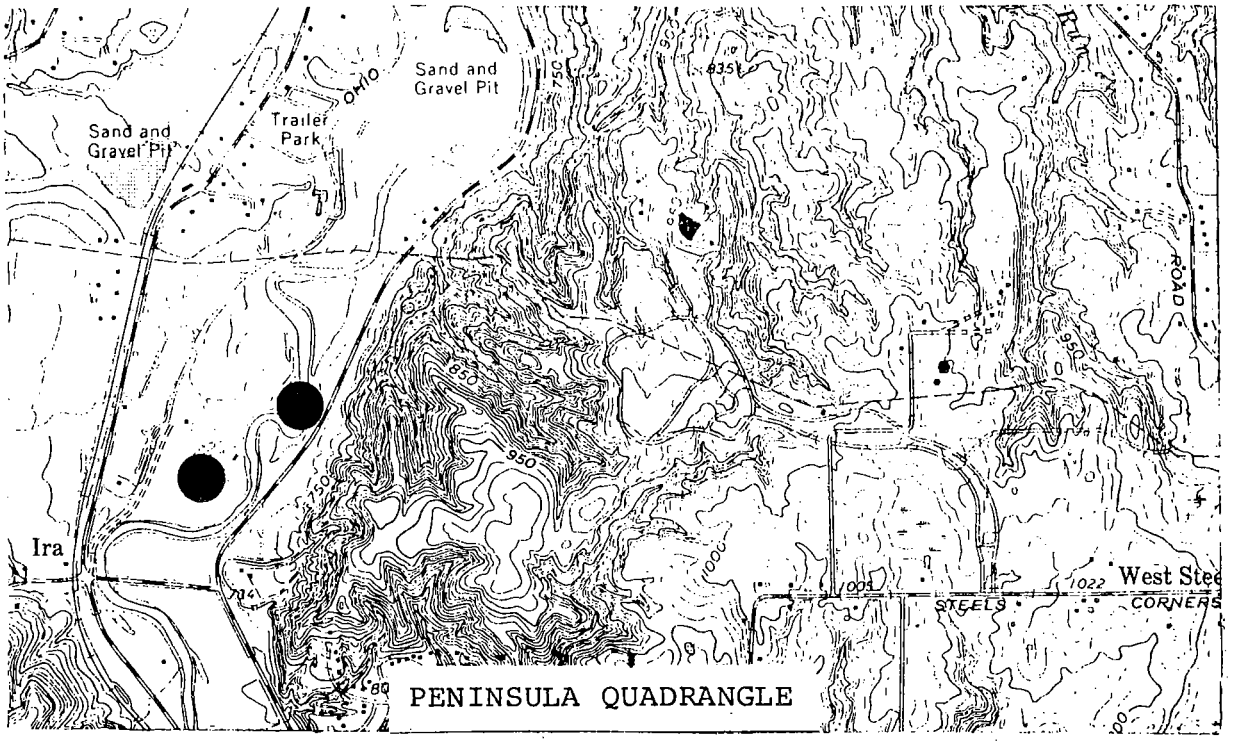


Fig. 19. Collecting sites for Red-eared Turtles.

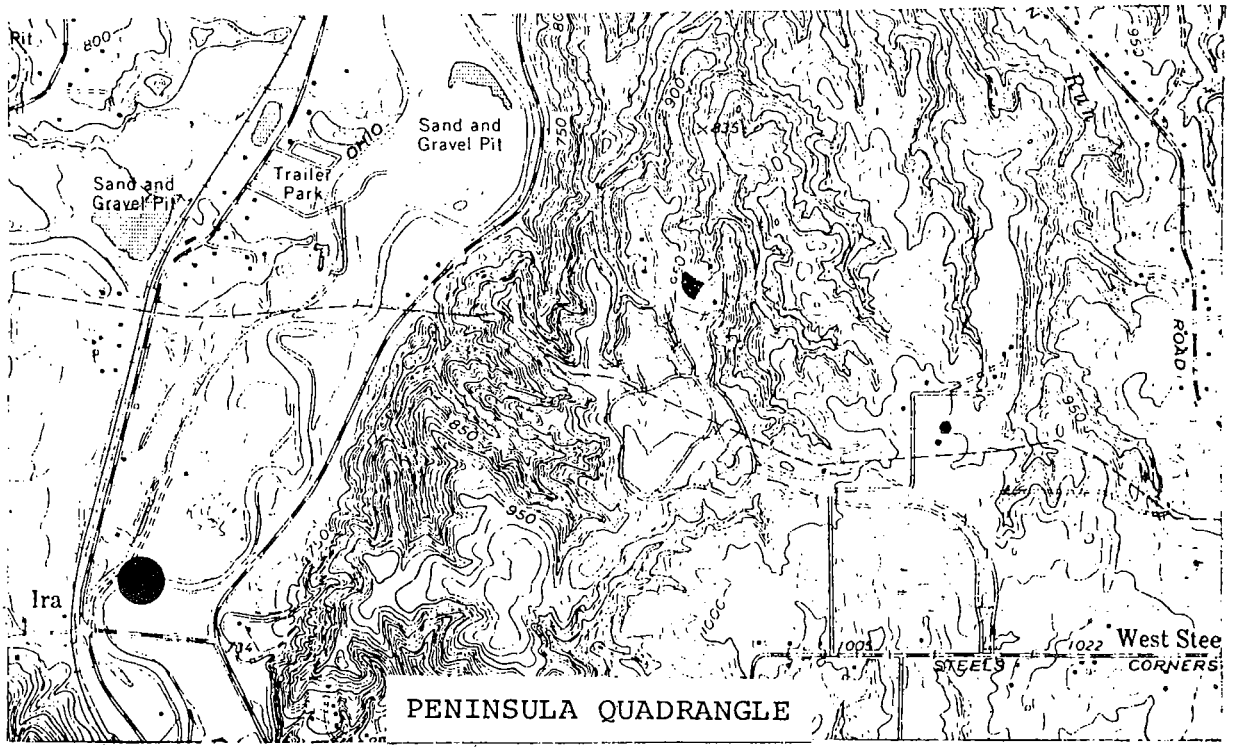


Fig. 20. Collecting site for a Stinkpot Turtle.

and dip netting in the many excellent habitats in the Park will eventually indicate the species is far more abundant than our present data indicate.

LOCALITIES: Fig. 20. Skeleton including plastron and carapace found along Ohio and Erie Canal near Ira Rd.-Riverview Rd. intersection.

CURRENT STATUS: Rare.

Eastern Box Turtle, Terrapene carolina carolina

This is another species that is commonly sold as pets, causing confusion among herpetologists when the turtles are released beyond their ranges after being in captivity. However, the relatively large number of Box Turtles recorded from the Stumpy Basin area suggests that a breeding population has become established there. As in the case with Red-eared Sliders, more studies should be conducted on the Box Turtles to determine if our view that the species is now established in the Park is justified.

LOCALITIES: Fig. 21. Three individuals collected at east of Peninsula near the Turnpike Stumpy Basin on three different occasions; beside Boston-Mills Rd.

CURRENT STATUS: Rare.

Painted Turtle, Chrysemys picta marginata

This is undoubtedly the most common turtle species in the Park and is found in virtually every aquatic habitat in the Park. On one occasion, 15 individuals were removed from one trap placed in an oxbow pond near the Cuyahoga River.

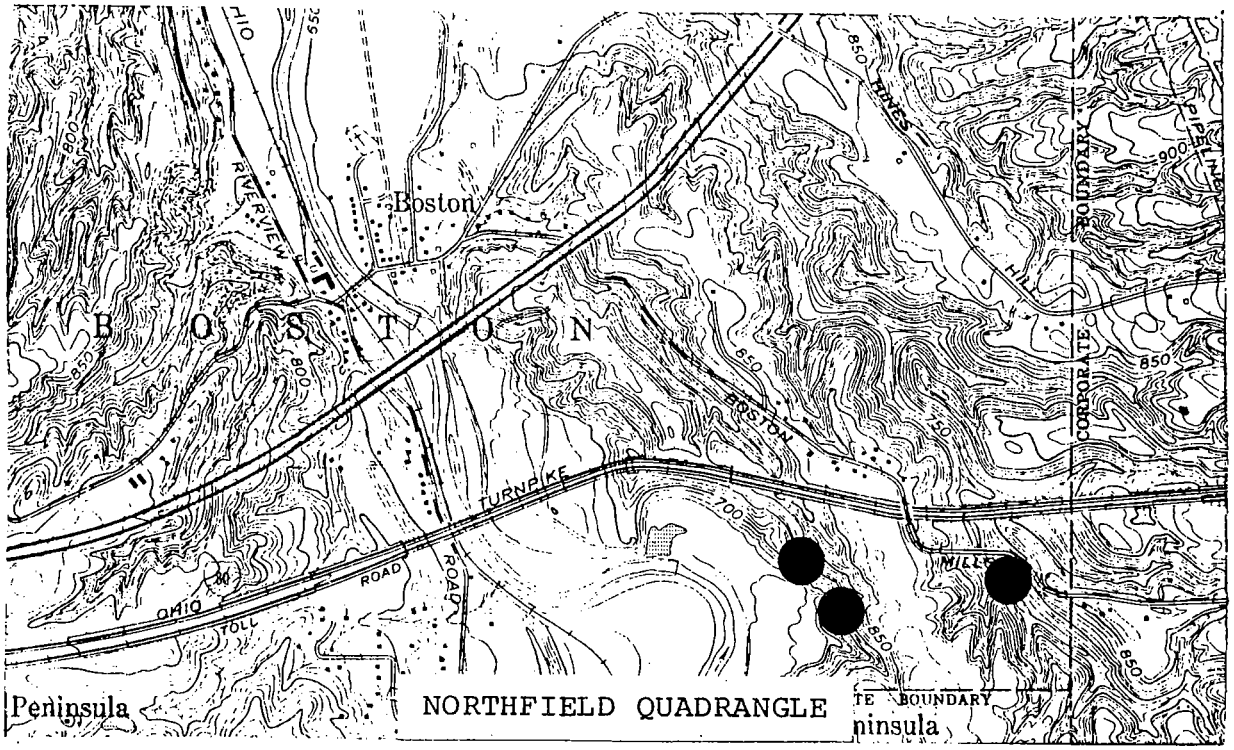


Fig. 21. Collection sites for Eastern Box Turtles.

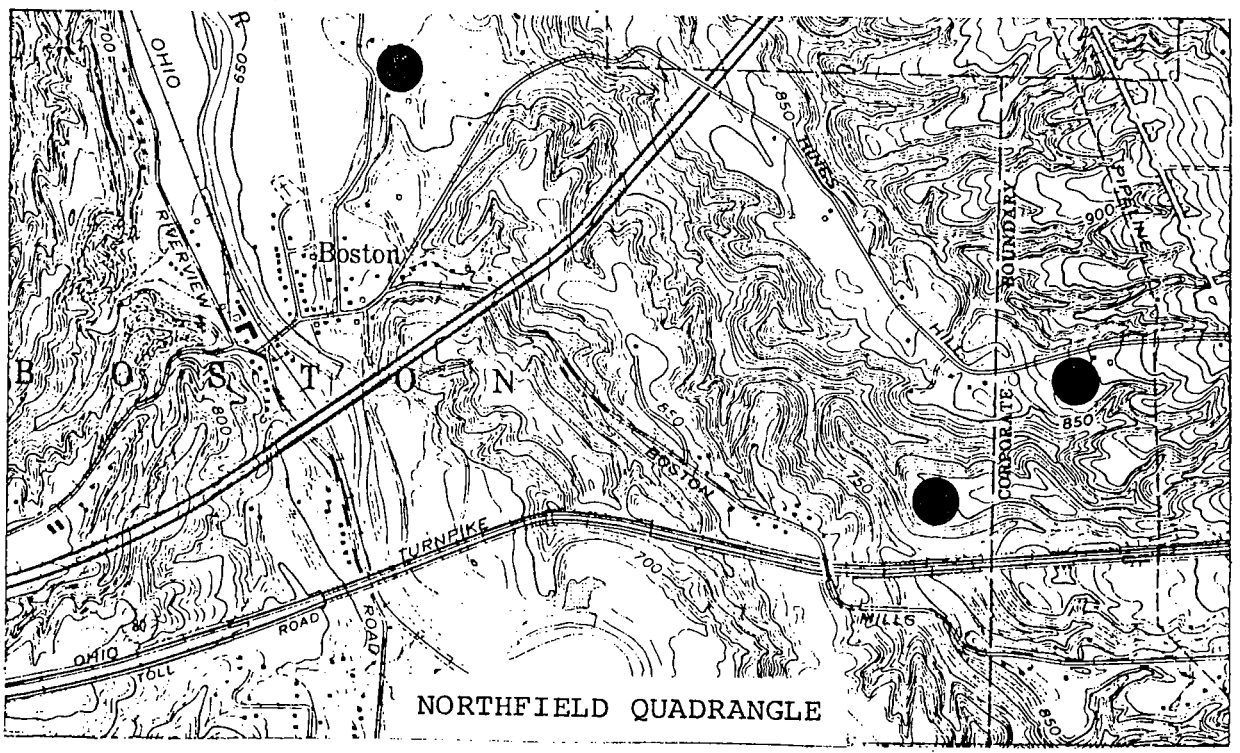


Fig. 22a. Collection sites for Painted Turtles.

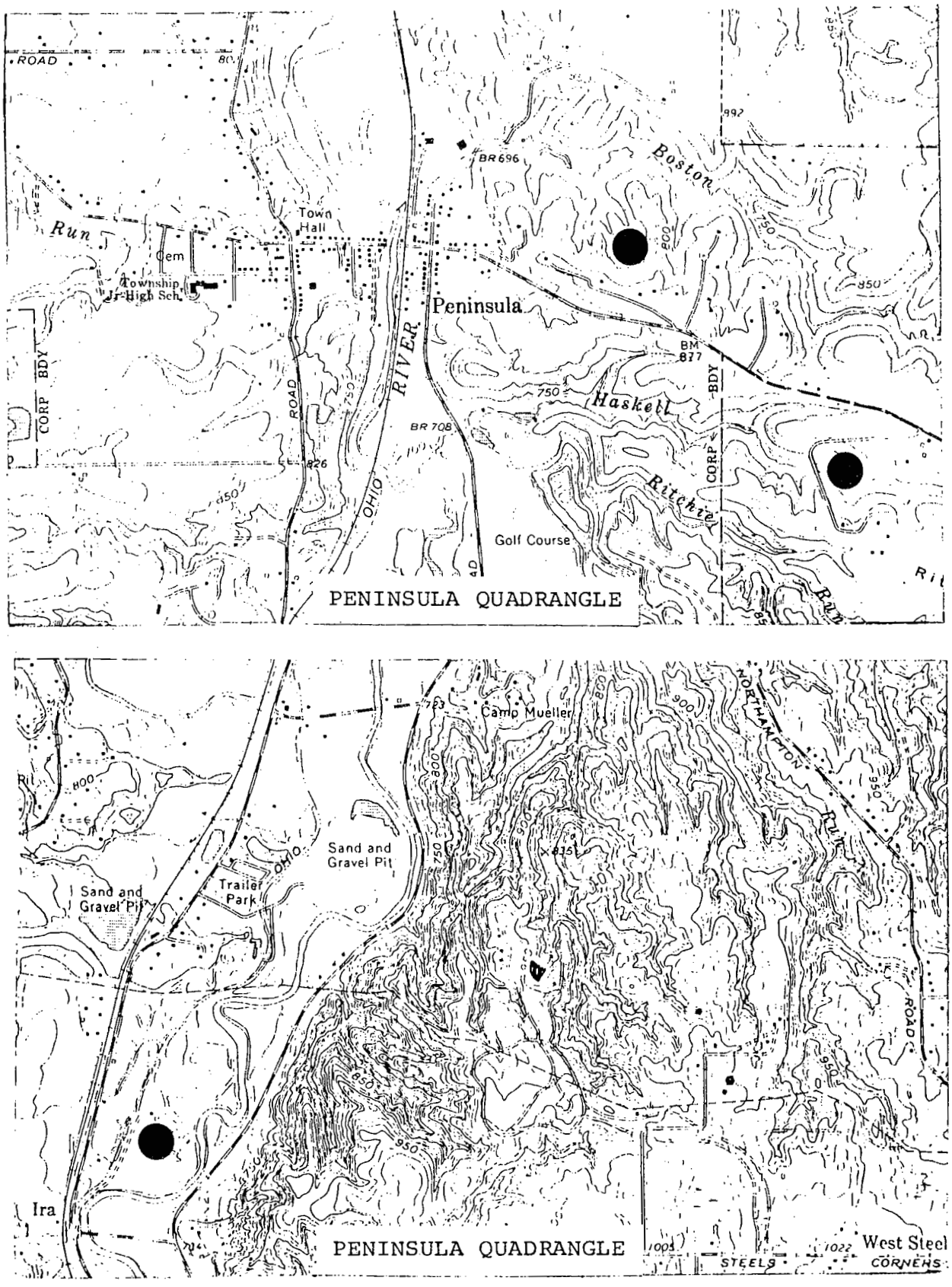


Fig. 22b. Collection sites for Painted Turtles (continued).

LOCALITIES: Fig. 22a, 22b. In pond off Hines Hill Rd. 1 mile west of Old Route 8; in pond 0.3 mile northeast of Boston Mills-Turnpike intersection; in pond east of Stanford Rd. and 0.5 mile north of Boston Mills Rd.; in pond north of Pine Lane off Rt. 303 east of Peninsula; in oxbow pond northeast of Ira Rd.-Riverview Rd. intersection; Lake Butler, Boy Scout Camp Butler.

CURRENT STATUS: Common.

Spotted Turtle, Clemmys guttata

We have only one record for this endangered species. The fact that there are no bogs in the Park probably will mean that relatively few additional records of this species will be recorded.

LOCALITIES: Fig. 23. Along edge of Haskell Run by Happy Day Information Center off Rt. 303.

CURRENT STATUS: Rare.

ORDER: Squamata

SUB-ORDER: Serpentes

FAMILY: Colubridae

Brown Snake, Storeria dekayi dekayi

One of our earlier surveys of the herpetofauna of the CVNRA was conducted when a number of abandoned homes were still standing in the Park. The debris around these homesites provided excellent habitats for Brown Snakes. Since it does benefit from environmental alterations by humans, its numbers may decline in future years in the

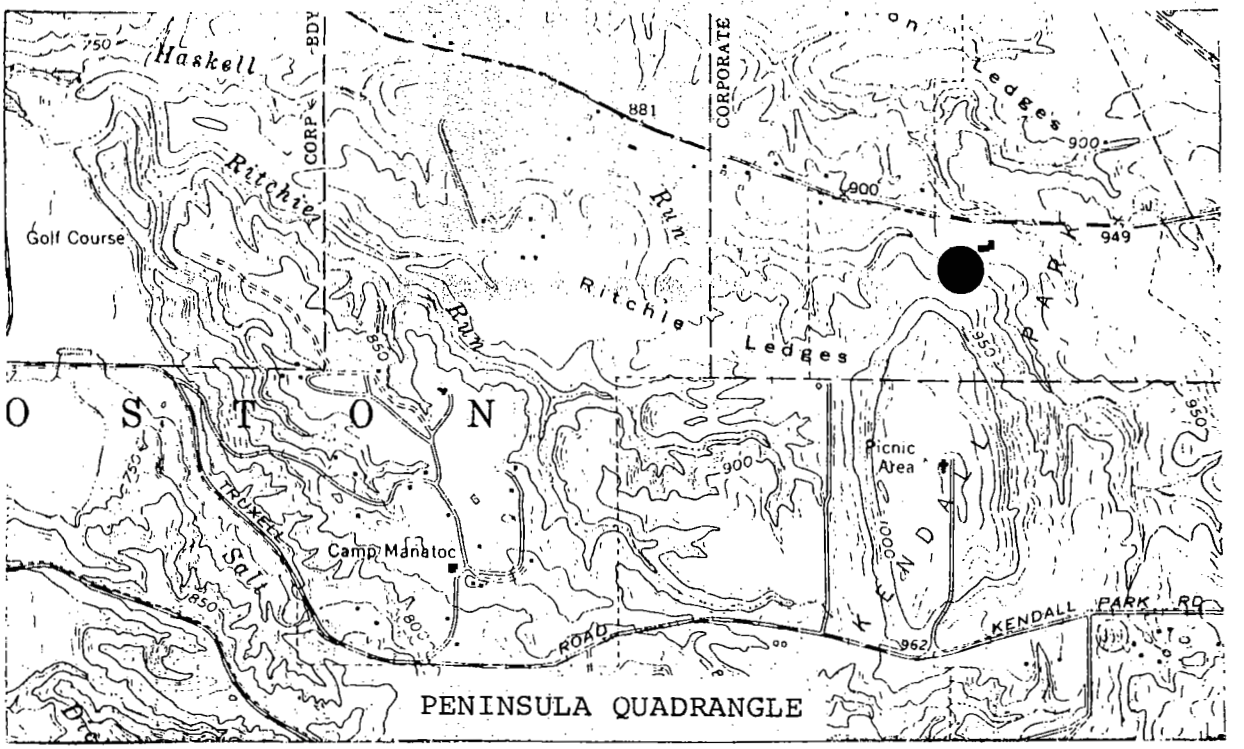


Fig. 23 Collection site for a Spotted Turtle.

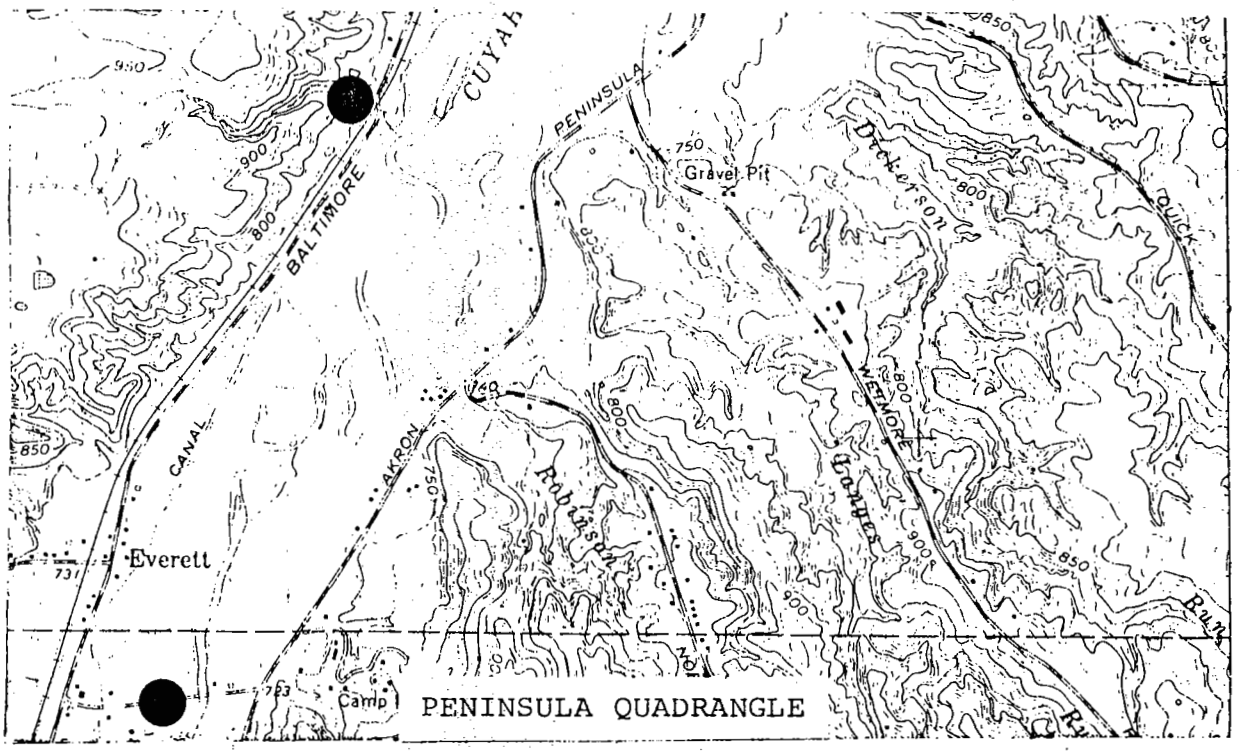


Fig. 24a. Collection sites for Brown Snakes.

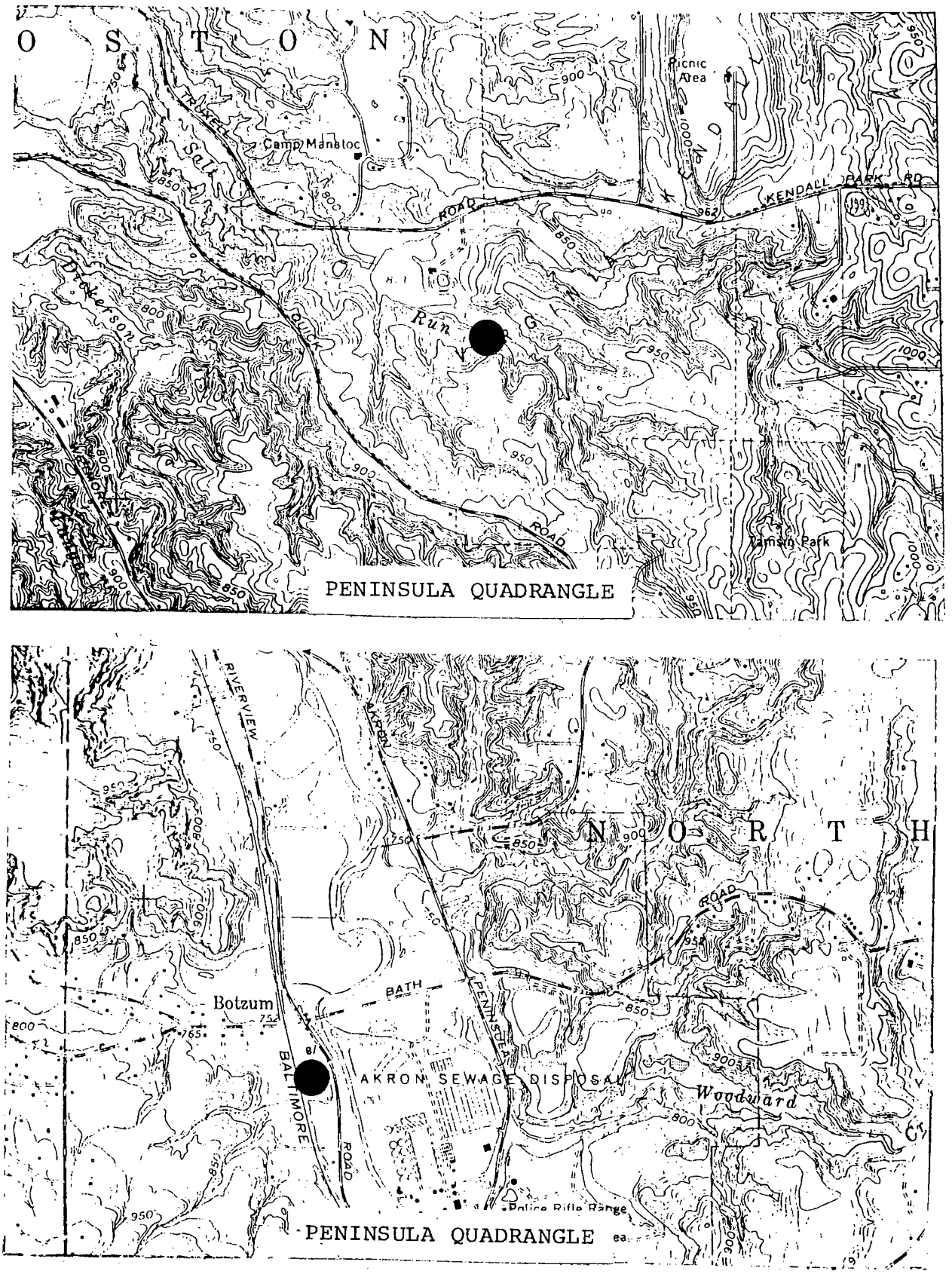


Fig. 24b. Collection sites for Brown Snakes (continued).

Park.

LOCALITIES: Fig. 24a and 24b. Around abandoned house on Riverview Rd. 0.3 mile south of Bath Rd. intersection; around abandoned house on Riverview Rd. south of Peninsula at railroad crossing; roadkill on Bolanz Rd.; along Salt Run Trail, Kendall Lake.

CURRENT STATUS: Common.

Redbelly Snake, Storeria occipitomaculata occipitomaculata

Few records are available for this secretive species in northeastern Ohio; e.g. Fischer's records (1965) of two individuals from a lumber yard in Boston Township, Summit Co. are the first reported for this species in Summit County. CVNRA personnel added the other two records for this diminutive species.

LOCALITIES: Fig.25. Boston Township, Summit County; from quarry on Akron-Pensula Rd. north of Camp Mueller; from Happy Day Information Center parking lot, off Rt. 303.

CURRENT STATUS: Rare.

Northern Water Snake, Nerodia sipedon sipedon

The abundant streams, ponds, and swamps of the Park provide many excellent habitats for this common species. Like other common aquatic species such as Green Frogs and Painted Turtles, Water Snakes are probably found in virtually every pond or lake in the Park.

LOCALITIES: Figs. 26a and 26b. By pond off Hines Hill Rd. 1 mile west of Old Route 8; beside pond 0.2 mile west of above pond; along Brandywine Creek north of Stanford Rd.; Kendall Lake, Turxell Rd.;

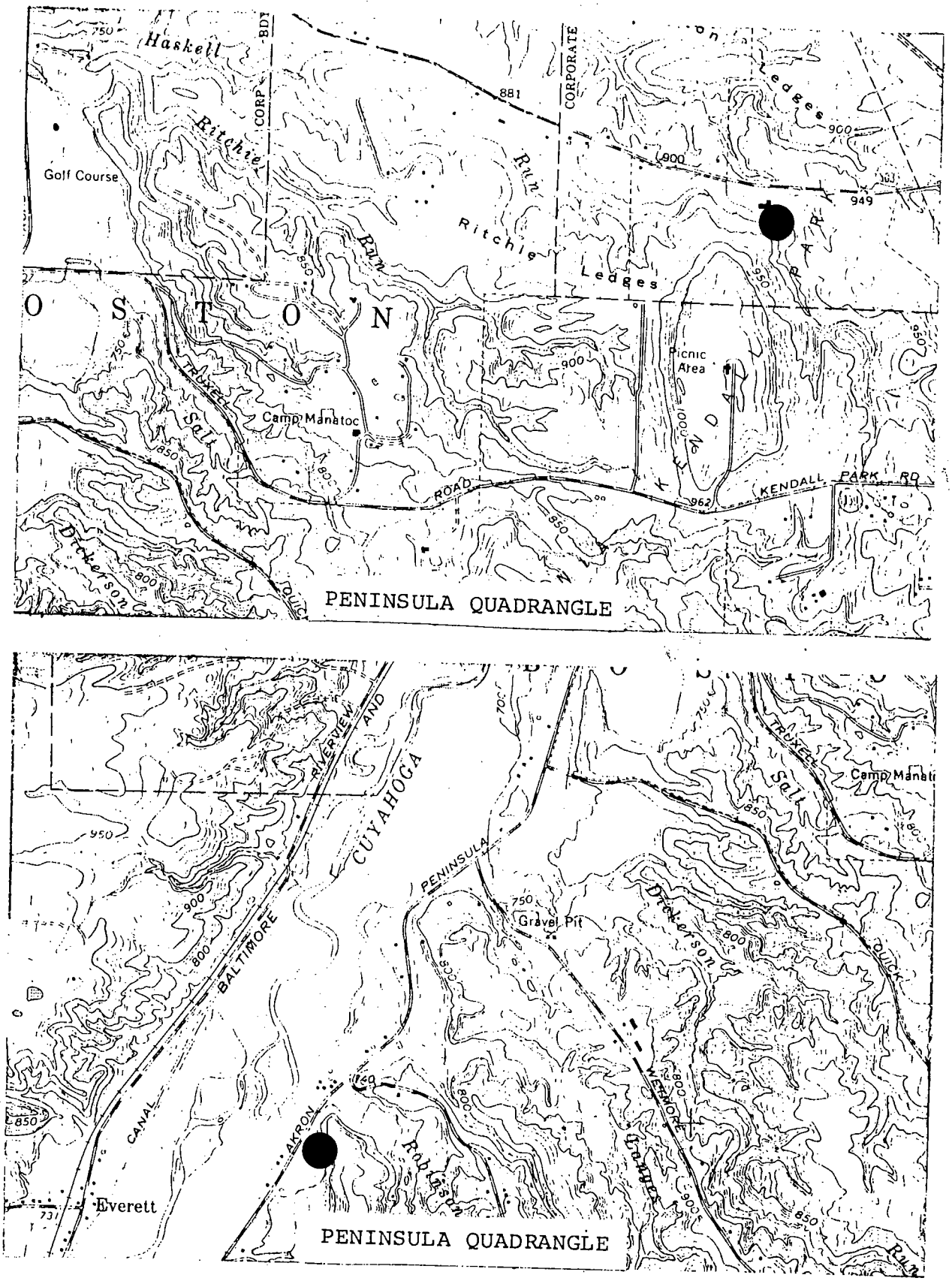


Fig. 25. Collection sites for Redbelly Snakes.

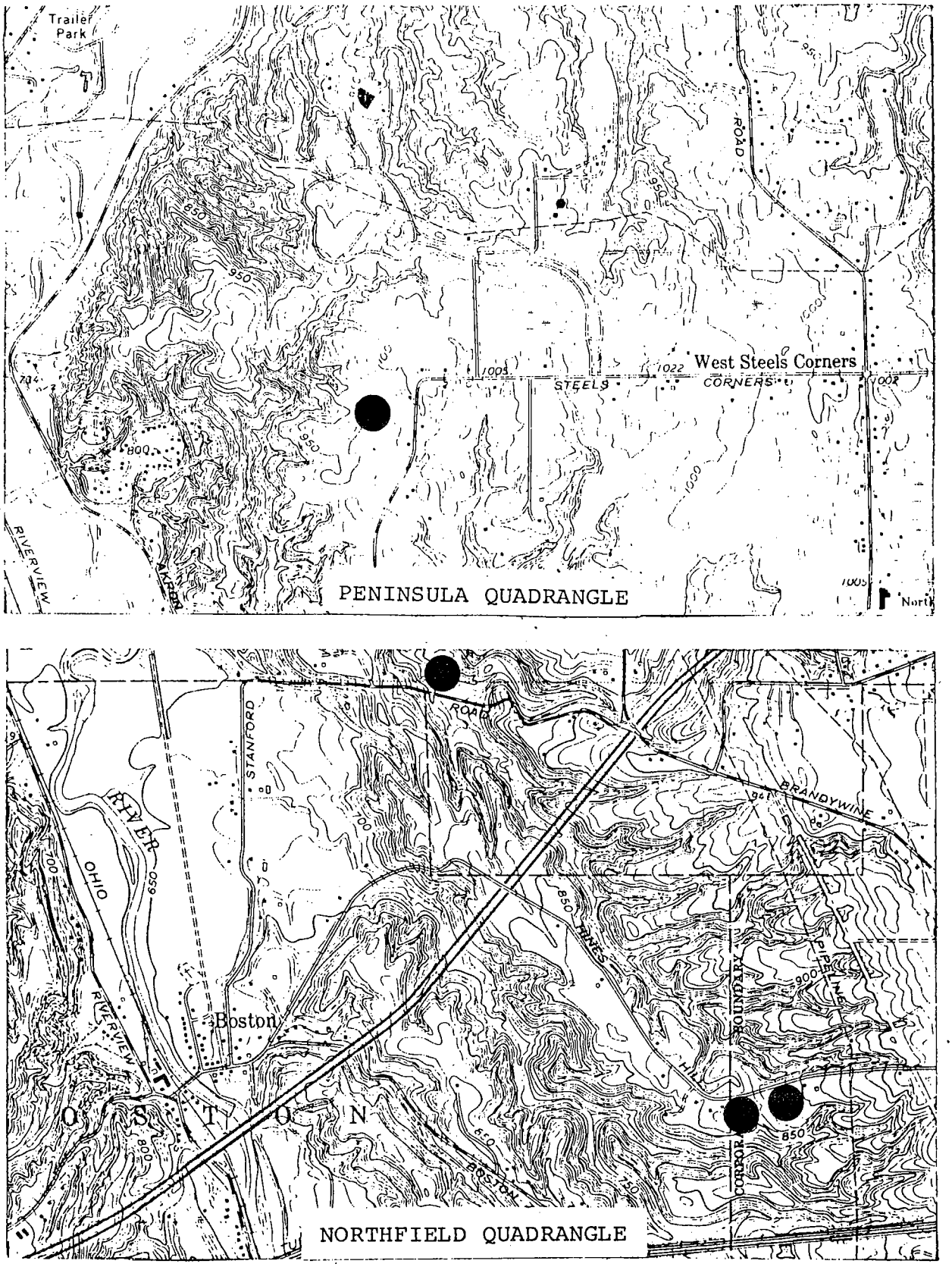


Fig. 26a. Collection sites for Northern Water Snakes.

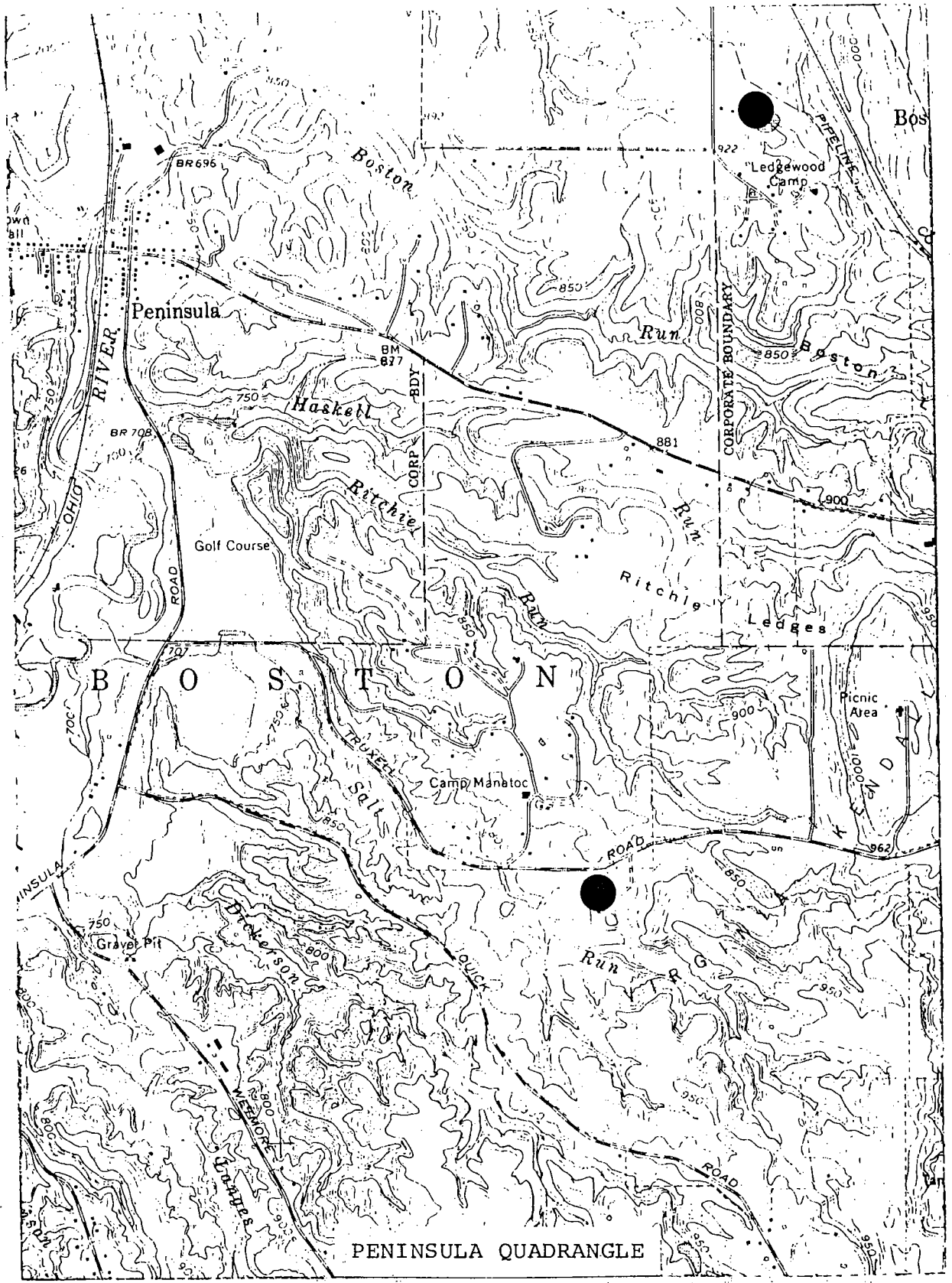


Fig. 26b. Collection sites for Northern Water Snakes (continued).

pond at Camp Ledgewwod; along Boston Run, Camp Ledgewood; behind a garage, Camp Ledgewood; beside pond off Steels Corners Rd.
CURRENT STATUS: Common.

Common Garter Snake, Thamnophis sirtalis sirtalis

The wide range of habitats occupied by this highly adaptable species bodes well not only for its survival in the CVNRA but throughout most of its range. We collected it from stream margins, old fields, woodlands, and abandoned cisterns.
LOCALITIES: Figs. 27a and 27b. Along Columbia Run; along Hines Hill Rd.; north of Hines Hill Rd. along railroad grade; along Robinson Run; in cisterns at abandoned houses on Boston Mills Rd. between Ohio Turnpike and Interstate 271; Pine Lane east of Peninsula off Rt. 303; Akron-Peninsula Rd. north of Northampton; around abandoned house on Riverview Rd. south of Peninsula at railroad crossing; dead on road, Bolanz Rd.; along Cuyahoga River near Riverview Rd. across from Towpath Village; around abandoned house on Snowville Rd.
CURRENT STATUS: Common.

Eastern Ringneck Snakes, Diadophis punctatus edwardsi

We collected a surprisingly large number of these nocturnal snakes in cisterns and around abandoned houses of the Park.
LOCALITIES: Figs. 28a, 28b, 28c. Around abandoned houses on Boston Mills Rd. between Ohio Turnpike and Interstate 271; Kendall Park at toboggan slide; Riverview Rd. south of Peninsula at railroad crossing;

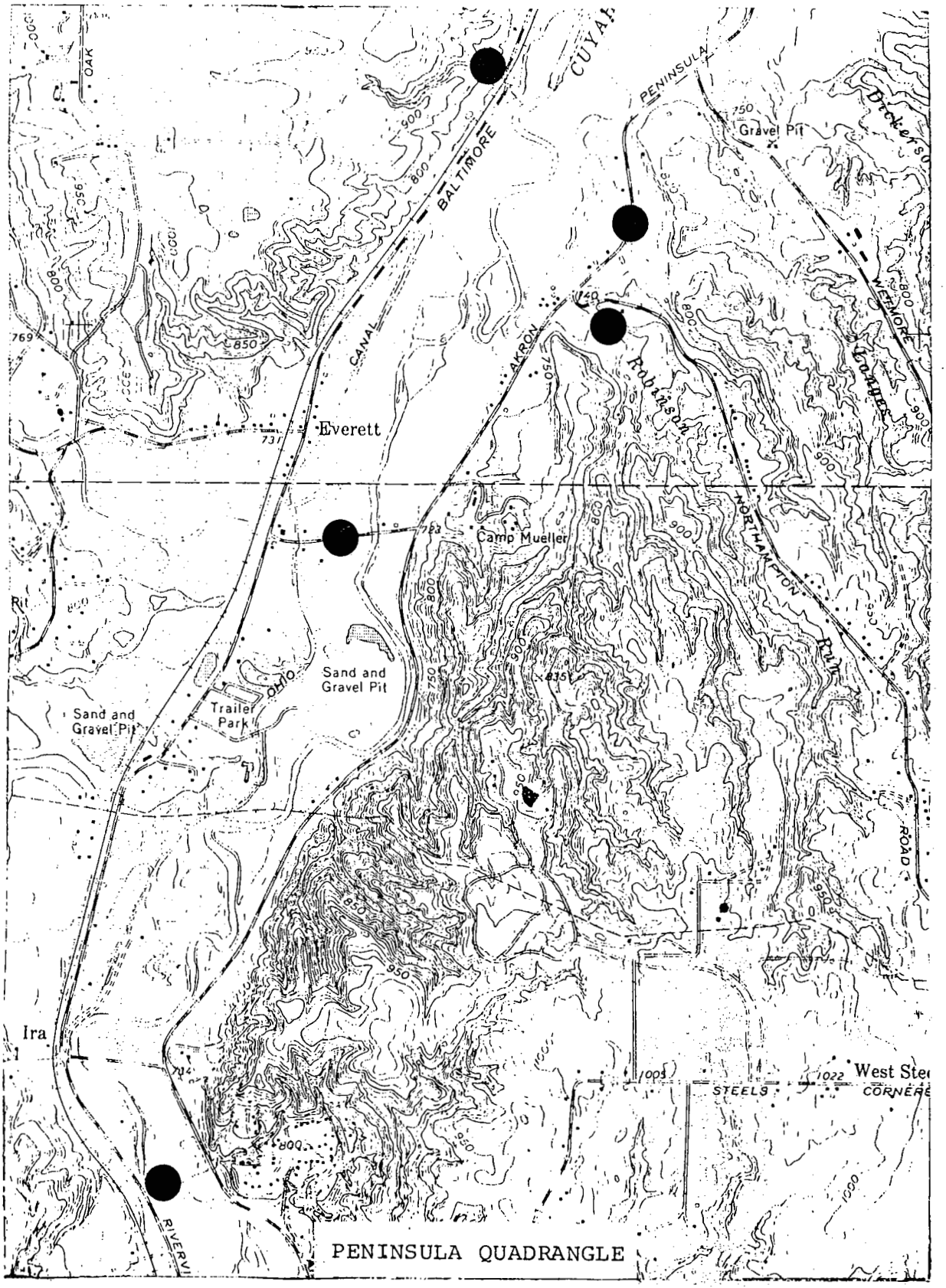


Fig. 27a. Collection sites for Common Garter Snakes.

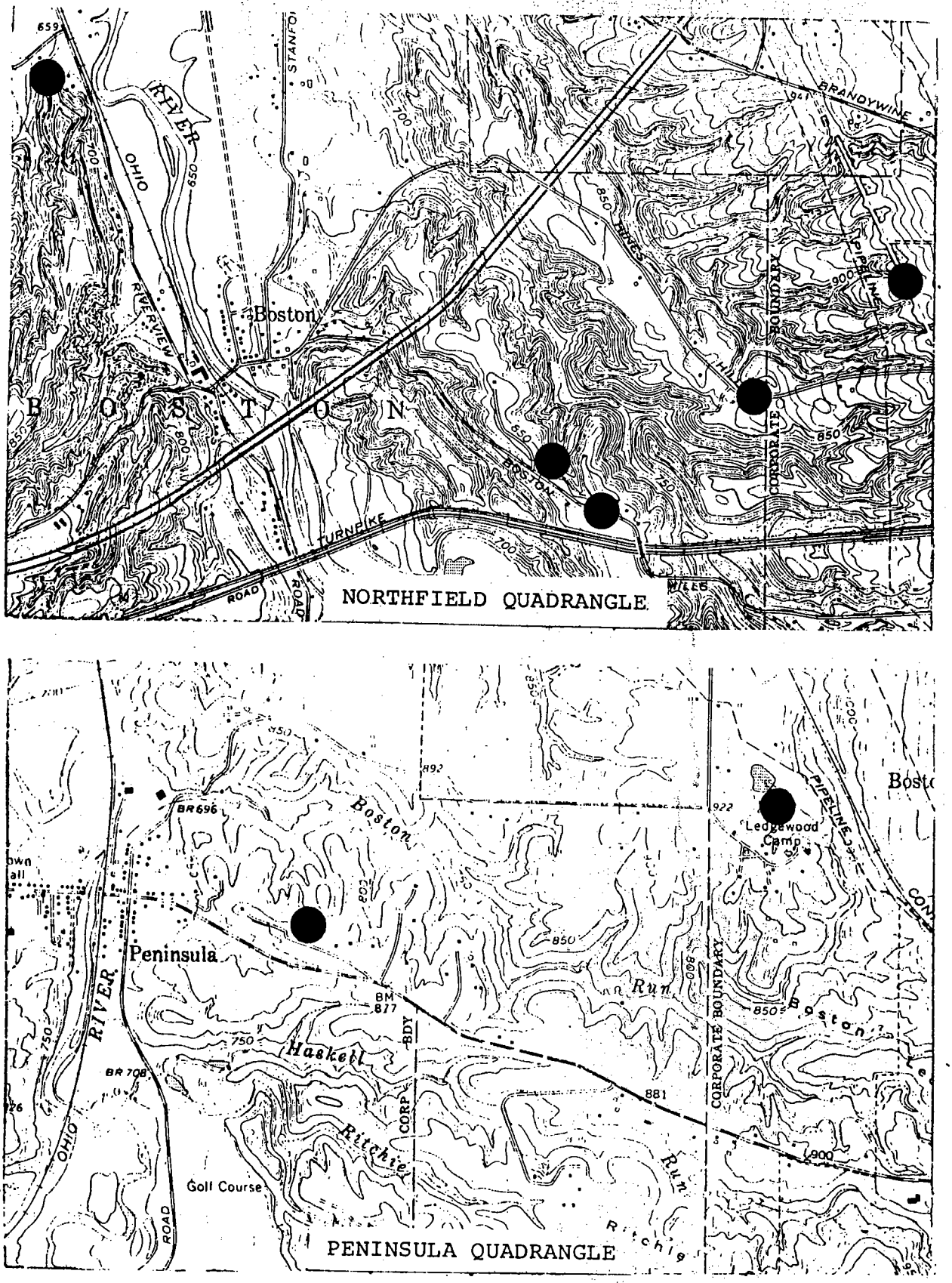


Fig. 27b. Collection sites for Common Garter Snakes (continued).

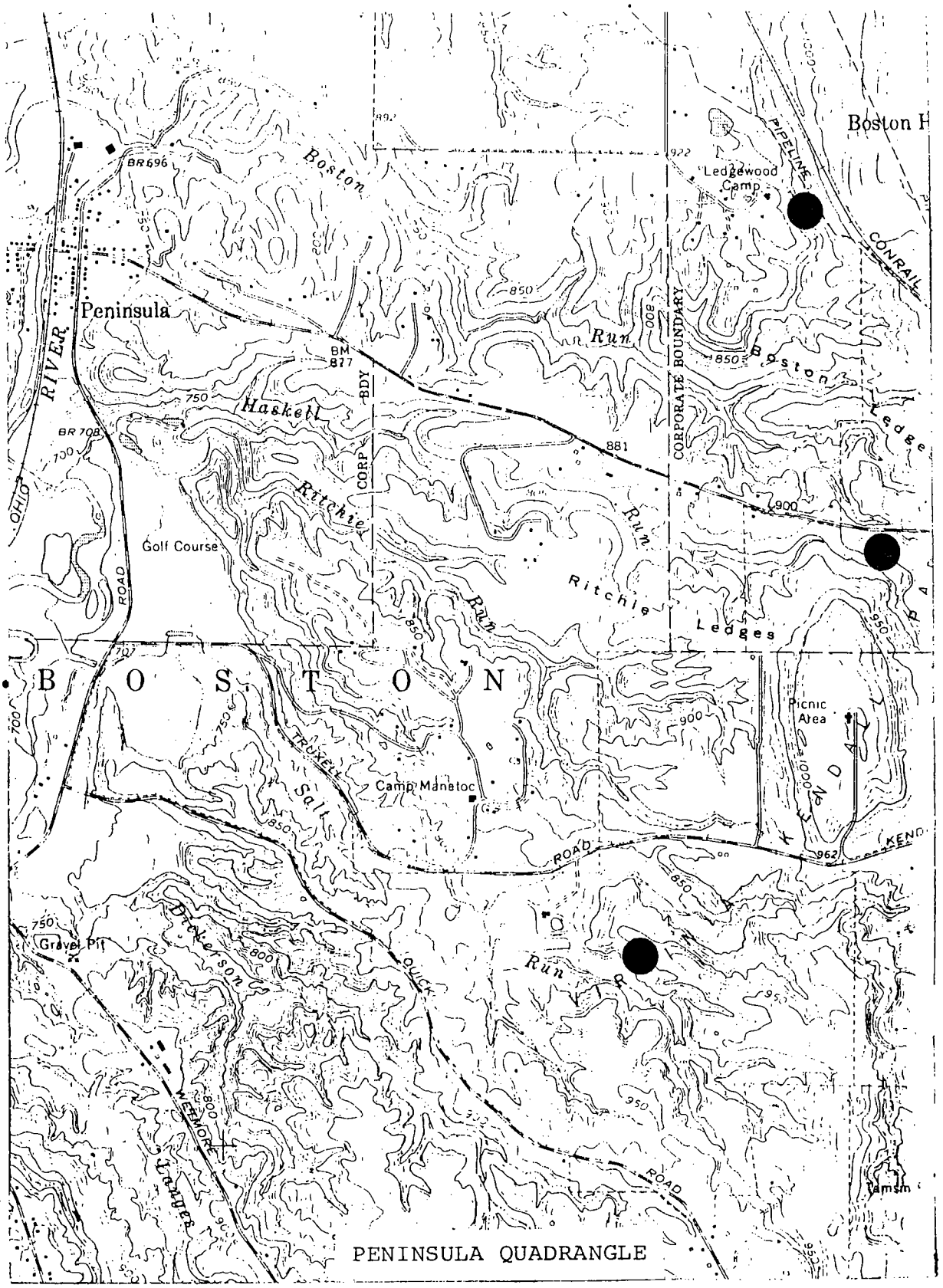


Fig. 28a. Collection sites for Eastern Ringneck Snakes.

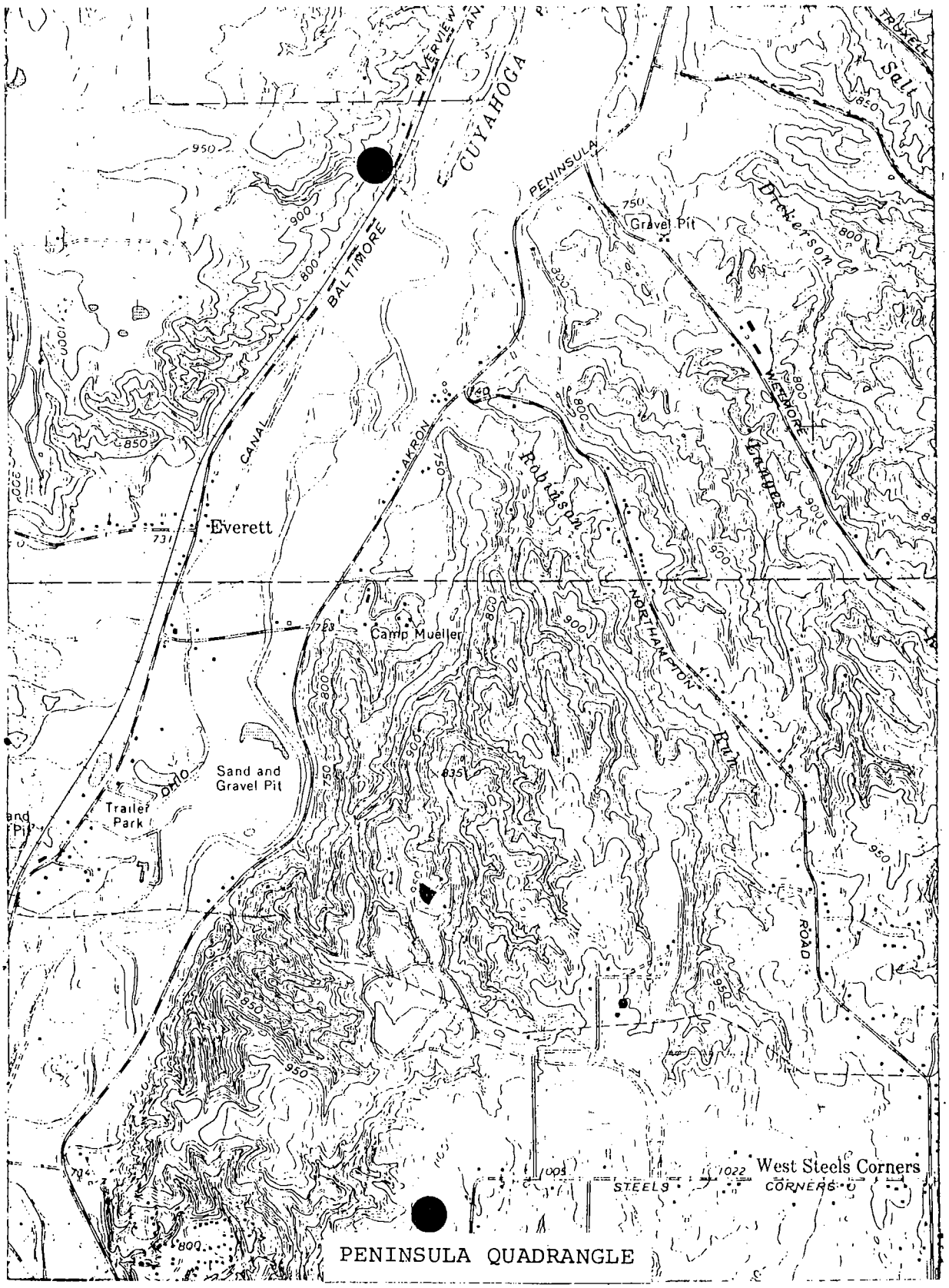


Fig. 28b. Collection sites for Eastern Ringneck Snakes (continued).

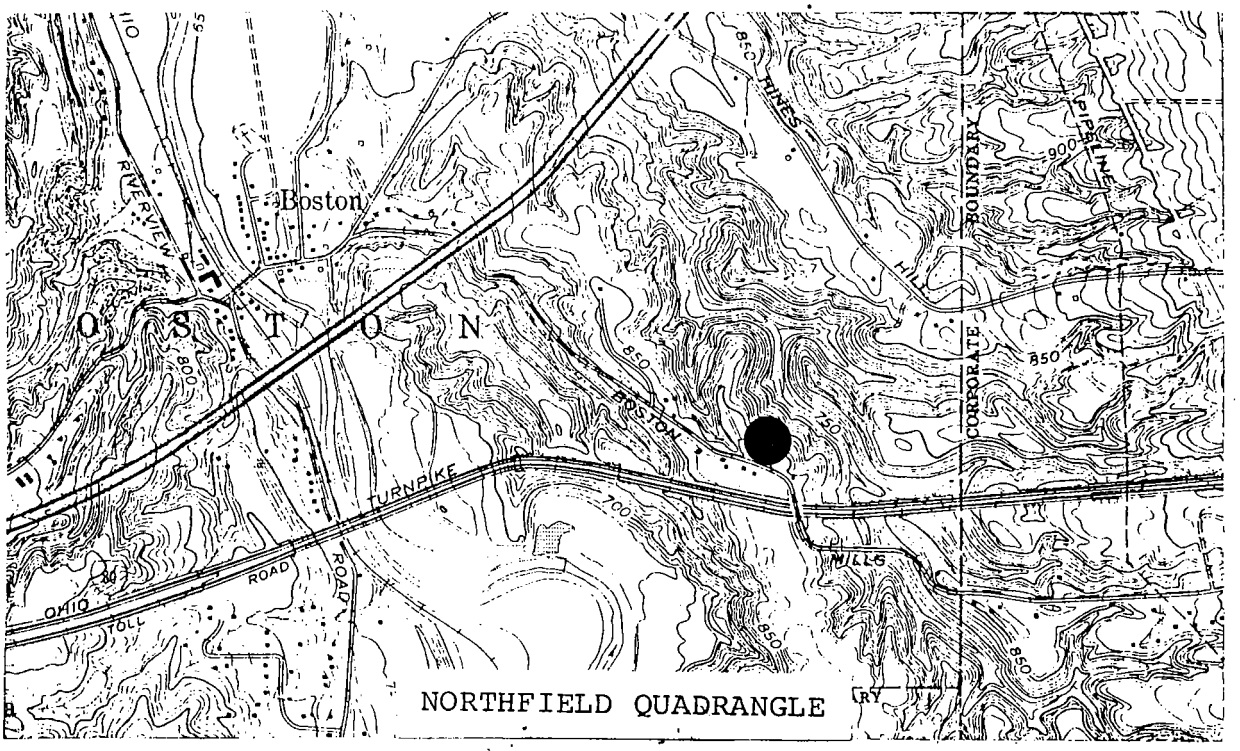


Fig. 28c. Collection site for Eastern Ringneck Snakes (continued).

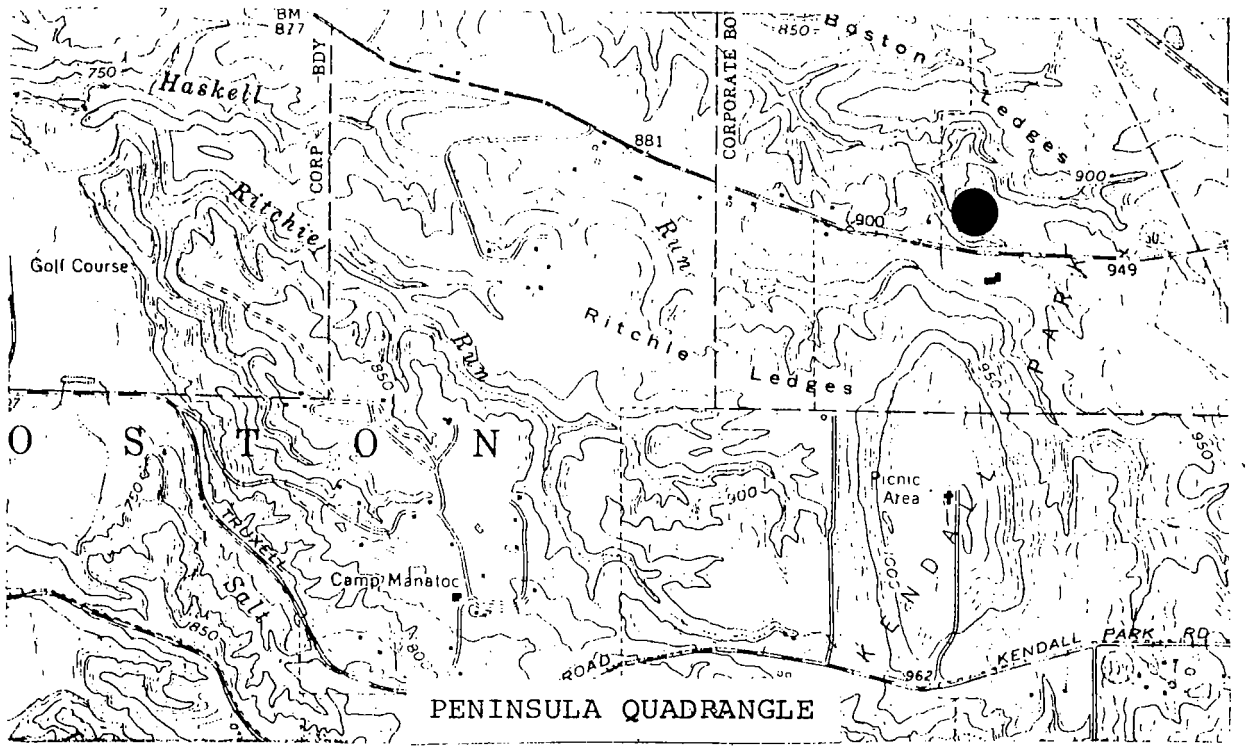


Fig. 29. Collection site for Eastern Racer.

along Boston Run at Camp Ledgewood.

CURRENT STATUS: Common.

Eastern Racer, (Intergrades) Coluber constrictor constrictor/foxi

As indicated in an earlier report (Orr, 1978), the CVNRA is in a zone of intergradation between two subspecies of Eastern Racers, Coluber constrictor constrictor and C. c. foxi . Thus Racers collected in the Park should be considered intergrades (Conant, 1951). Counts of subcaudal scales of two specimens collected in the Park support Conant's view that these Racers are probably intergrades.

LOCALITIES: Fig. 29. Beside Boston Run across Rt. 303 from Happy Day Information Center; Boston Twp., Summit Co., Northhampton Twp., Summit Co.

CURRENT STATUS: Uncommon.

Smooth Green Snake, Opheodrys vernalis vernalis

Although James S. Hine, formerly of the Ohio State Museum, reported that this species was common at Ira in Summit Count (Conant, 1951) it can hardly be considered abundant now in the CVNRA or elsewhere in northeastern Ohio. In fact, it has been given a "Special Animal" designation in Ohio by the Natural Heritage Program because of its rareness. The collection of a Smooth Green Snake by the tunnel steps leading to the Happy Days Information Center in 1981 was therefore a significant record for the herpetofauna of the CVNRA.

LOCALITIES: Fig. 30. Happy Day Information Center, off Rt. 303 east of Peninsula.

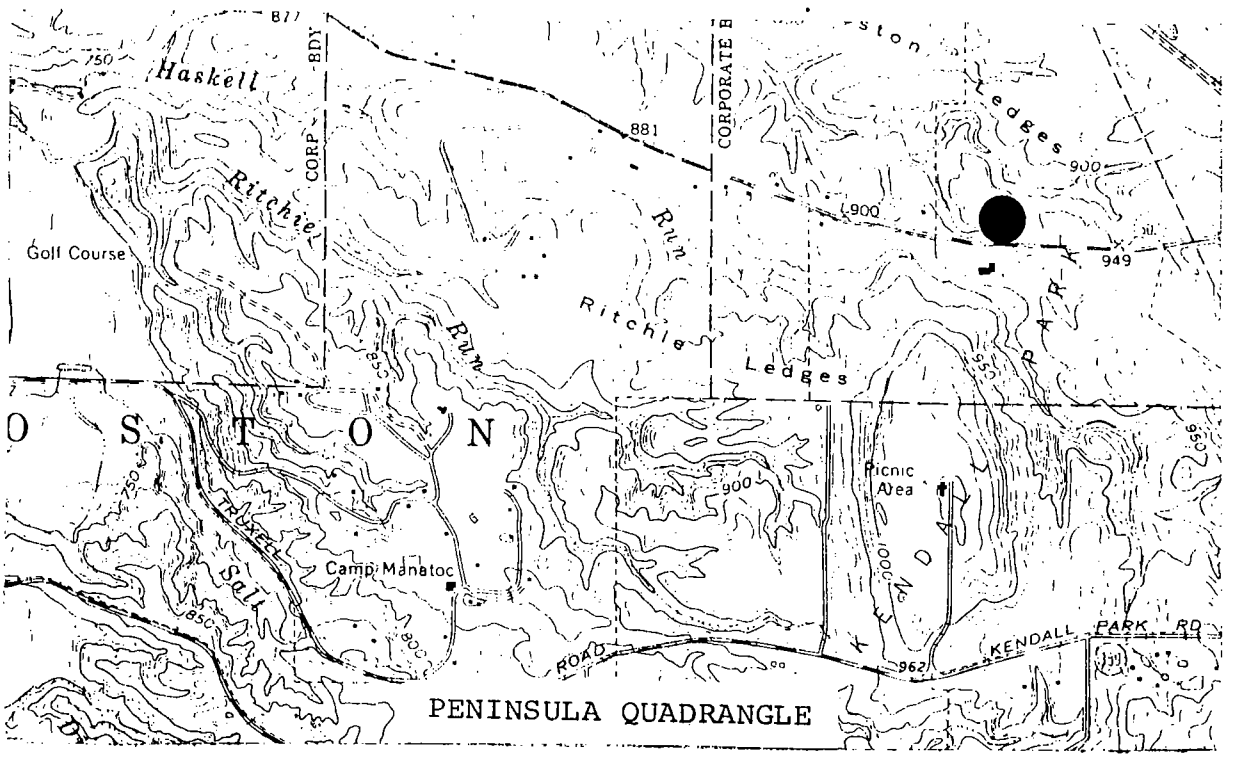


Fig. 30. Collection site for Smooth Green Snake.

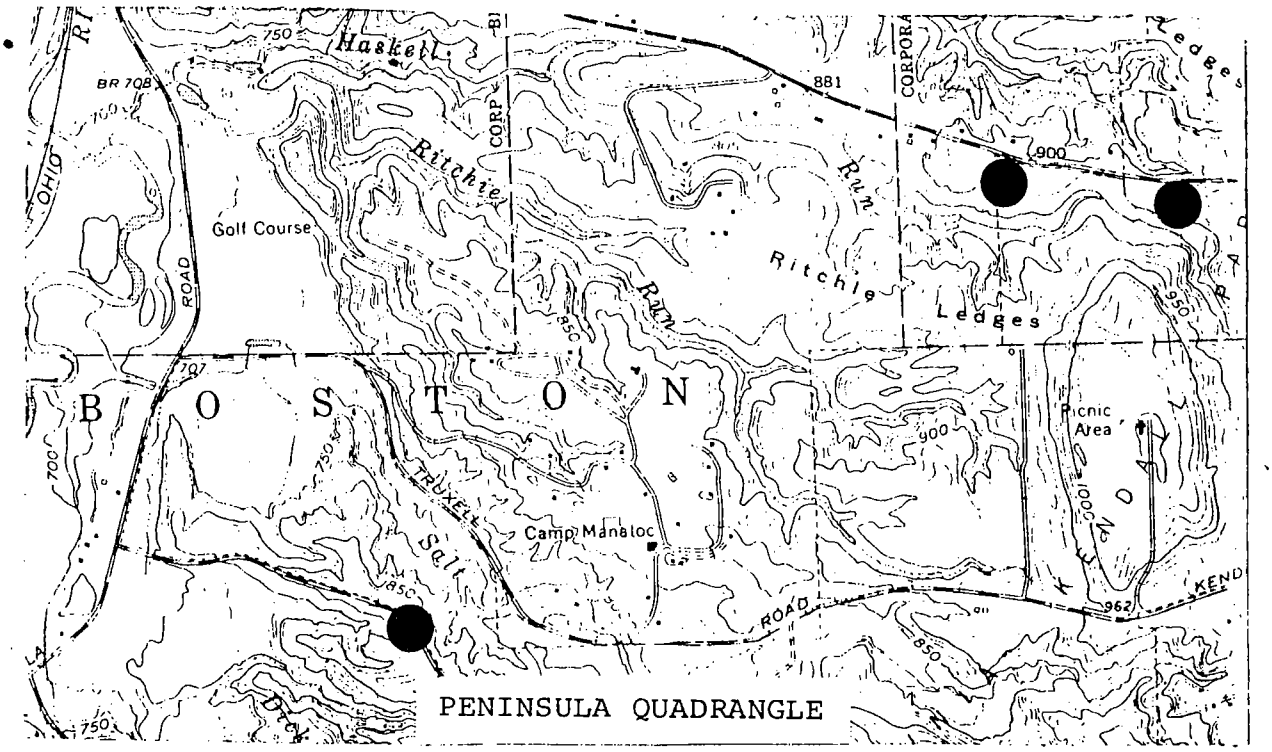


Fig. 31a. Collection sites for Milksnakes.

CURRENT STATUS: Rare.

Eastern Milksnake, Lampropeltis triangulum triangulum

We feel that the relatively few records of this species in the CVNRA reflect its current status in northeastern Ohio. Its resemblance to the Copperhead, a venomous species not found in the Park, results in many Milksnakes being killed by those who misidentify them (Orr,1978).

LOCALITIES: Figs. 31a, 31b. Roadkill on Quick Rd; Happy Day Information Center, off Rt. 303 east of Peninsula; Major Rd. 1.1 mile west of Riverview Rd.

CURRENT STATUS: Uncommon.

Eastern Ribbon Snake, Thamnophis sauritus sauritus

The relatively few records we have of the Ribbon Snake probably is not an accurate reflection of its abundance in the Park. We feel that in the future it will be found to be a moderately common species.

LOCALITIES: Fig. 32a and 32b. Beside pond off Steels Corners Rd.; between I-271 and Turnpike in vicinity of Stumpy Basin.

CURRENT STATUS: Uncommon.

Rat Snake, Elaphe obsoleta obsoleta

This largest of all Ohio snakes has been collected on three occasions near wooded areas, a common habitat for the species. Because of its size, many additional records undoubtedly will be recorded for this handsome species.

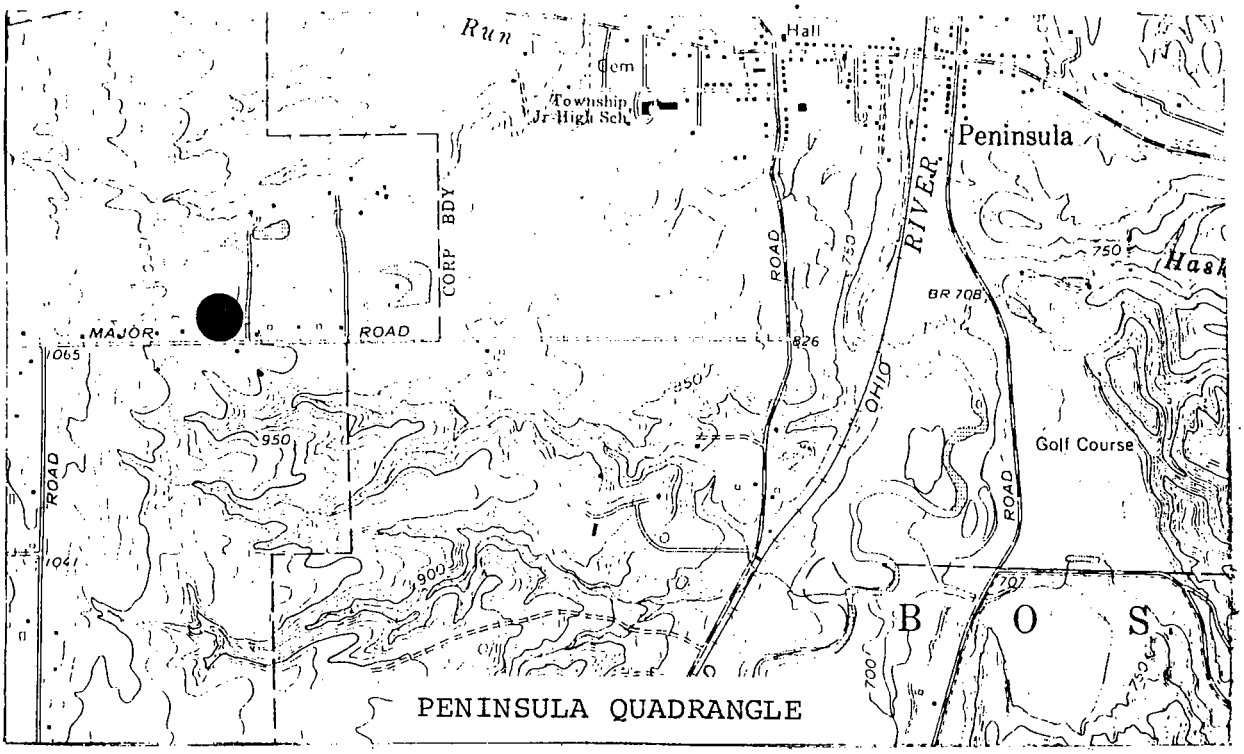


Fig. 31b. Collection site for a Milksnake (continued).

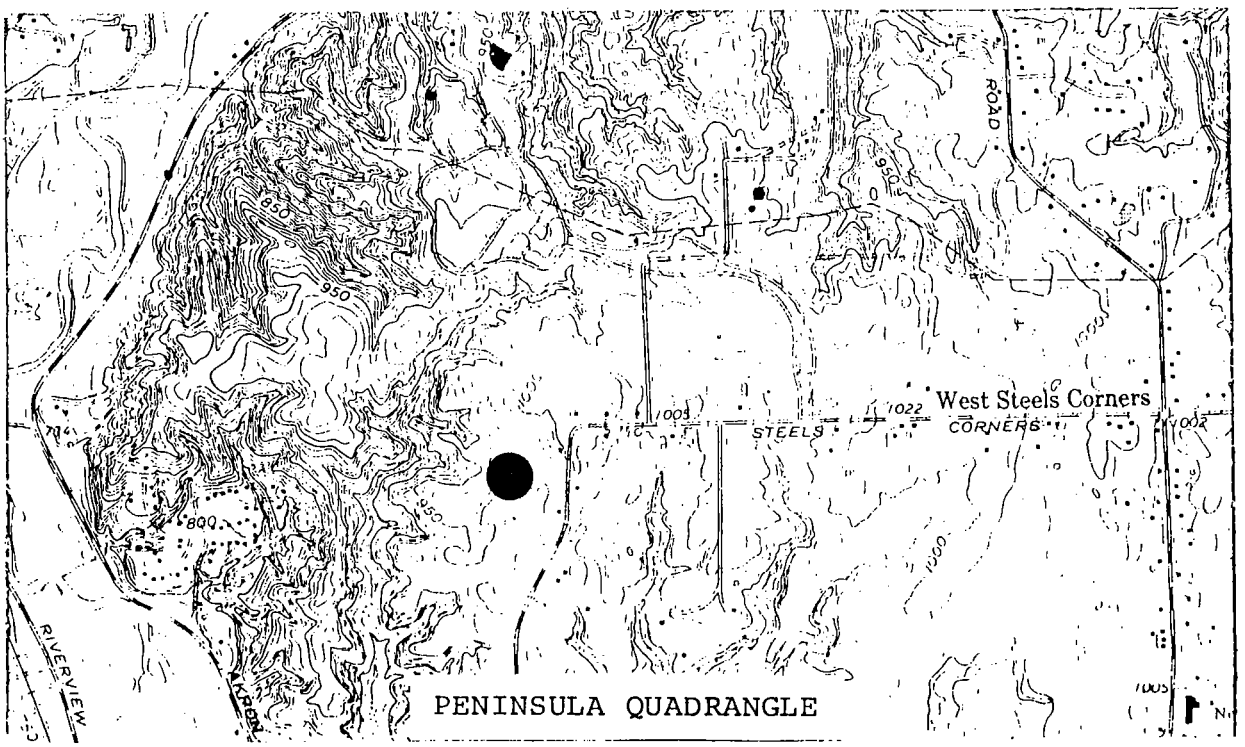


Fig. 32a. Collection site for an Eastern Ribbon Snake.

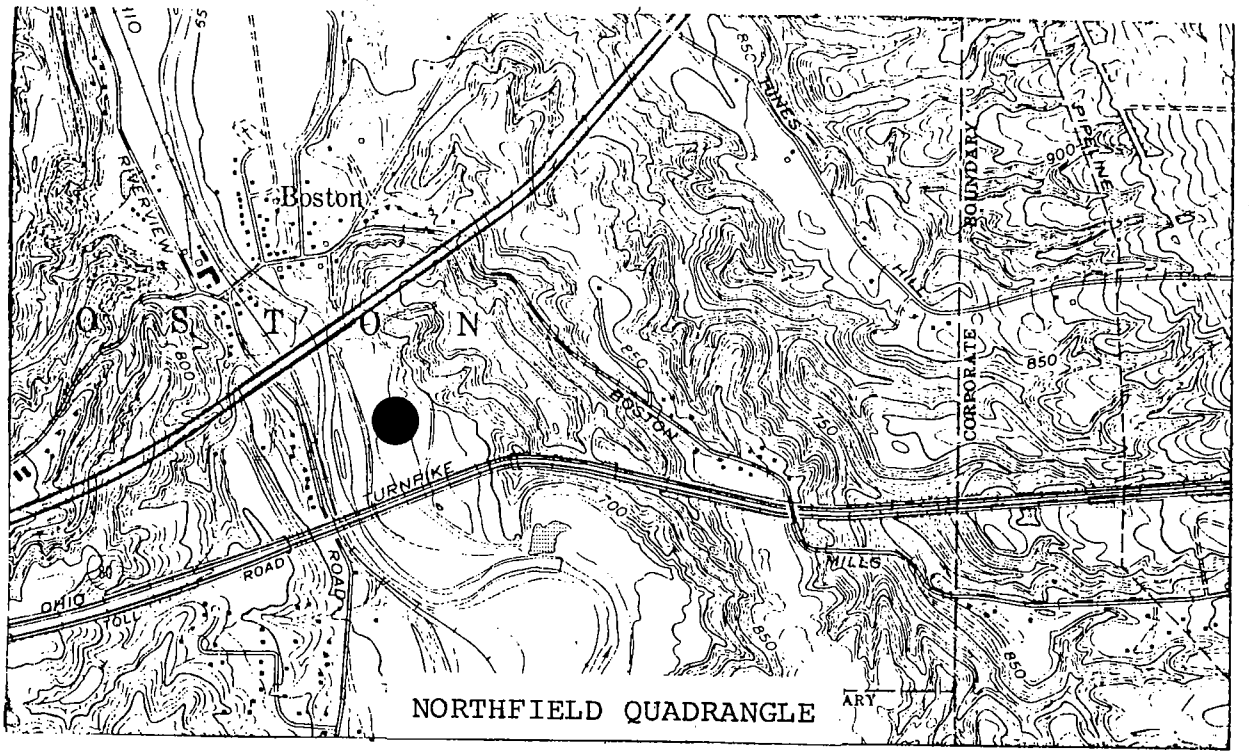


Fig. 32b. Collection site for an Eastern Ribbon Snake (continued).

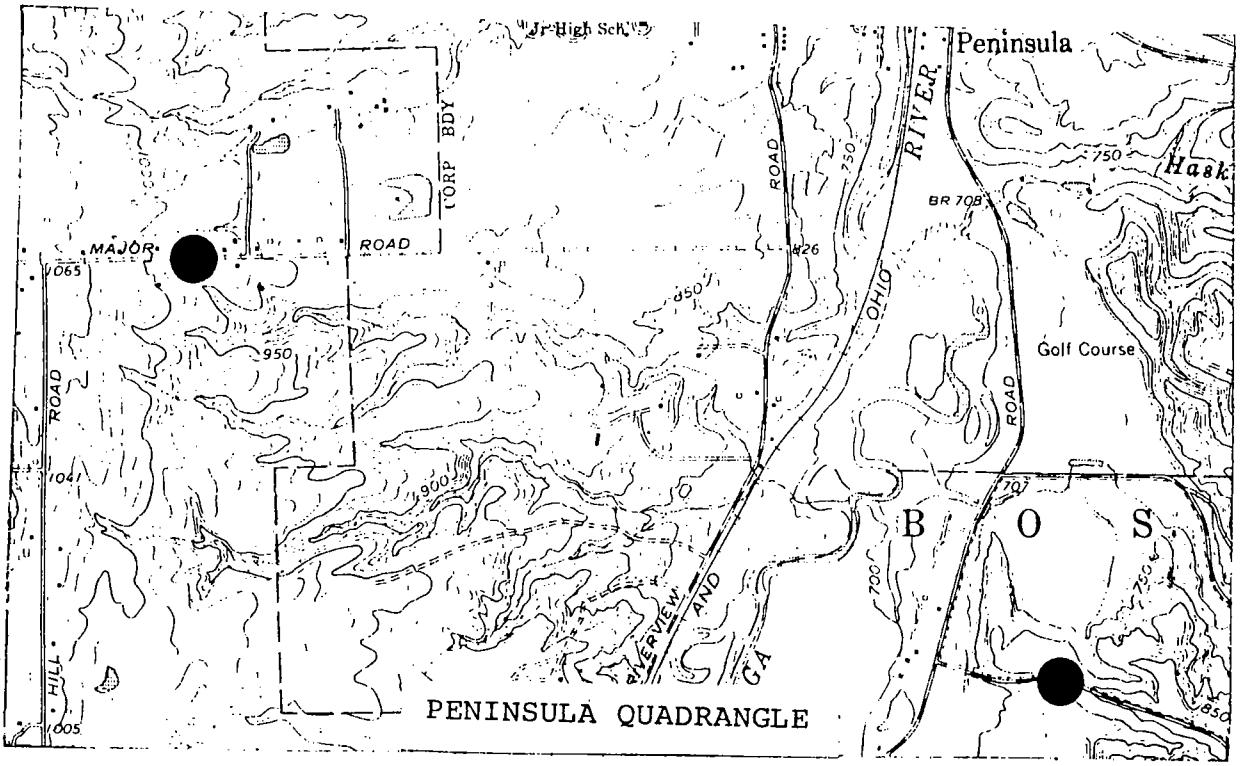


Fig. 33a. Collection sites for Rat Snakes.

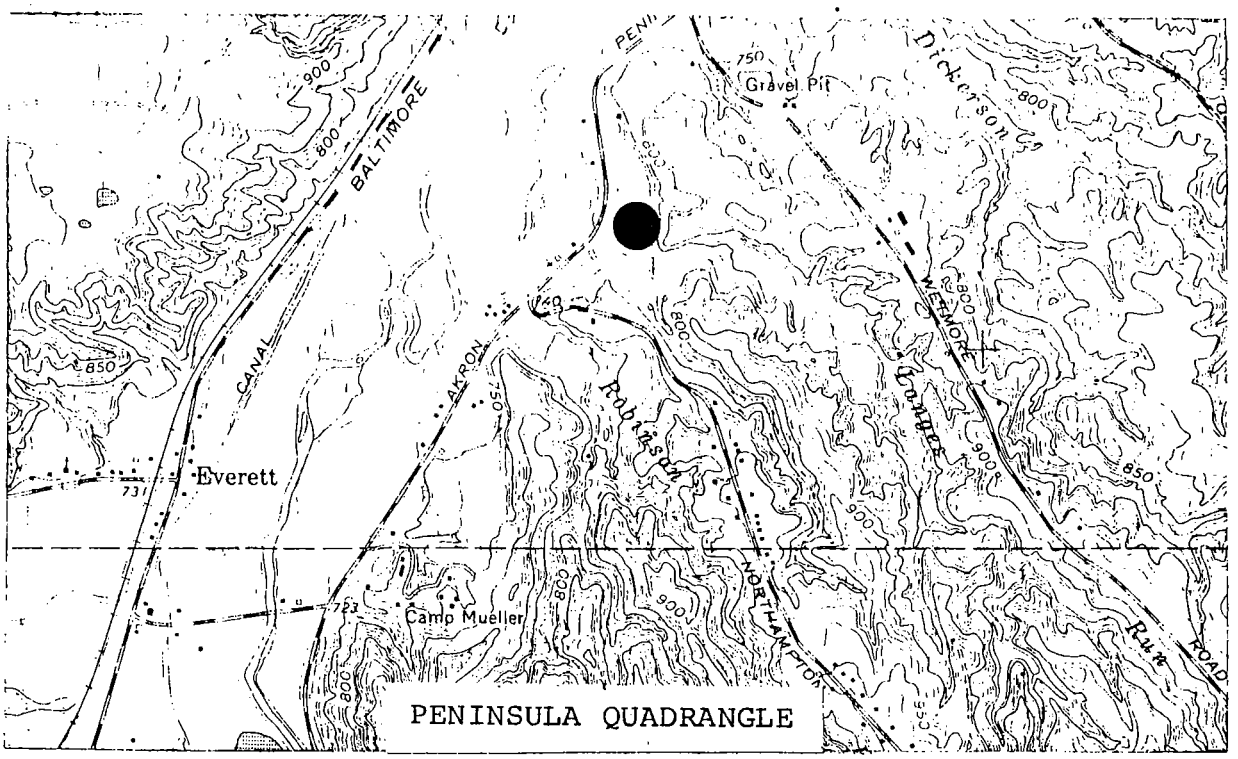


Fig. 33b. Collection site for a Rat Snake (continued).

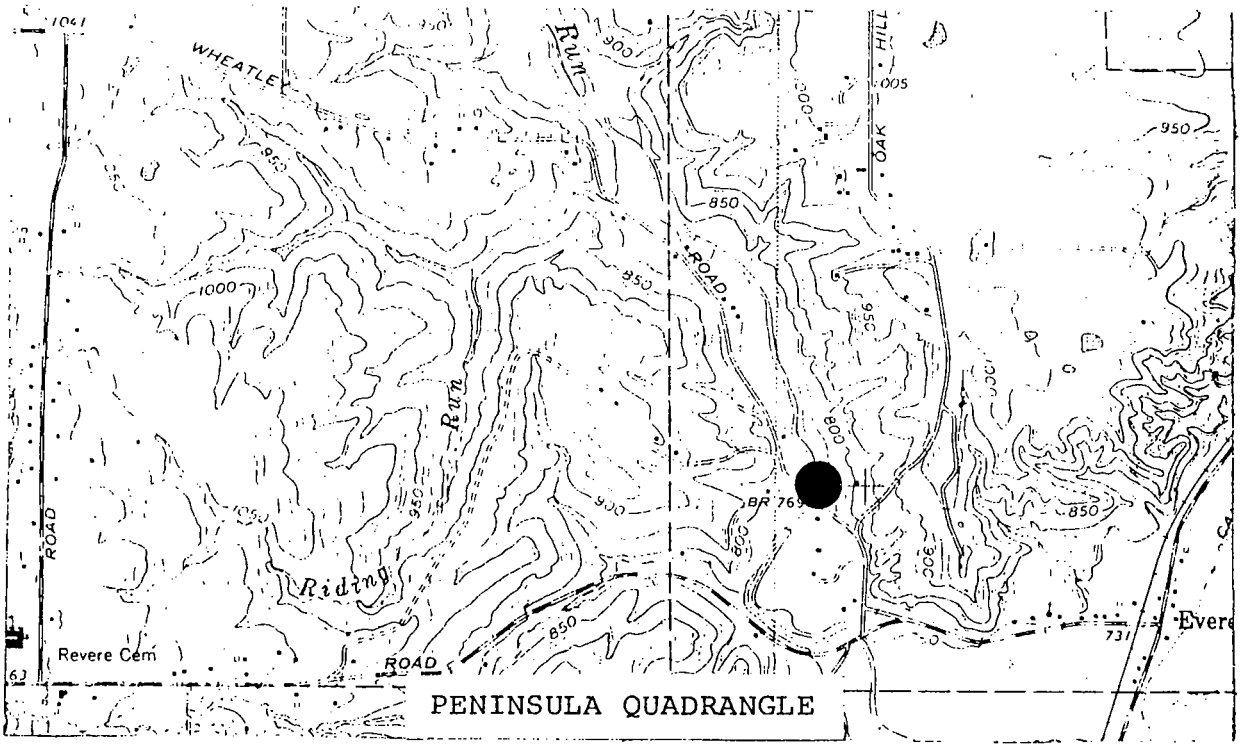


Fig. 34. Collection site for Queen Snakes.

LOCALITIES: Fig. 33a and 33b. Dead on Quick Rd.; near edge of Langes Run off Akron-Peninsula Rd.; on Major Rd. 1.2 mile west of Riverview Rd.; Northampton Twp., Summit Co.

CURRENT STATUS: Uncommon.

Queen Snake, Regina septemvittata

We have searched every tributary of the Cuyahoga River in the Park in an attempt to collect Queen Snakes, a crayfish-eating species which commonly is found under rocks in or beside streams. We have only two records for the species in the Park and are unable to explain why it appears to be rare.

LOCALITIES: Boston Twp., Summit Co.; dead on Akron-Peninsula Rd.

CURRENT STATUS: Rare.

Mammals

Our field studies coupled with records from the CVNRA files document the presence of 31 species of mammals in the CVNRA. These species along with their habitats are given in Table 2 while the locality records are plotted on U.S.G.S. topographic maps in Figures 35-64b.

ORDER: Marsupialia

FAMILY: Didelphidae

Virginia Opossum, Didelphis virginiana (Kerr)

TABLE 3. Mammals known to occur in the Cuyahoga Valley National Recreation Area. Breeding habitats are underlined and preferred habitats are indicated with an asterisk (*). Numbers in parentheses identify habitats on an existing CVNRA vegetation study map. A cross (+) indicates species observed or collected by project investigators.

SPECIES	Maple-Sycamore Forest (1)	Oak-Beech-Maple Forest (2+5)	Hemlock-Beech Forest (3)	Oak-Hickory Forest (4)	Scrub-Oldfield (6)	Wet Meadow (7)	Cultivated-Suburban Land (8+9)	Barren Land (12)	Pine-Spruce Forest (11)	Swamp	Ponds and Lakes	Stream-Stream Edge
Opossum +	x	x		x	x		x*					
Masked Shrew +	x	x			x*		x		x			
Smoky Shrew +	x	x			x*			x	x			
Short-tailed Shrew+	x	x*	x	x*	x*	x	x*	x	x	x		
Hairy-tailed Mole +		x		x	x*		x					
Eastern Mole +					x		x*					
Star-nosed Mole +						x				x*	x*	x
Brown Myotis +	x	x*	x	x*			x					
Big Brown Bat +	x*	x*	x	x*			x*					
Eastern Cottontail+	x	x		x	x*		x*			x		
Eastern Chipmunk +	x	x*	x	x*	x		x					
Woodchuck +	x	x		x	x		x*					
Gray Squirrel +	x	x*		x			x					
Fox Squirrel +	x	x		x*			x					
Red Squirrel +	x	x	x*	x					x*			

TABLE 3. (Continued). Mammals known to occur in the CVNRA.

SPECIES	Maple-Sycamore Forest (1)	Oak-Beech-Maple Forest (2+5)	Hemlock-Beech Forest (3)	Oak-Hickory Forest (4)	Scrub-Oldfield (6)	Wet Meadow (7)	Cultivated-Suburban Land (8+9)	Barren Land (12)	Pine-Spruce Forest (11)	Swamp	Ponds and Lakes	Stream-Stream Edge
Southern Flying Squirrel +	x	x		x*								
Beaver +						x				x	x*	x*
White-footed Mouse+	x	x*	x	x*	x		x*	x	x	x		
Meadow Vole +						x*	x	x		x		
Muskrat +						x				x*	x*	x*
Norway Rat +							x*					x
House Mouse +	x				x		x*					
Meadow Jumping Mouse	x					x				x*		x*
Red Fox +		x		x	x	x	x*	x	x	x	x	x
Gray Fox +	x	x	x	x*	x*		x					
Raccoon +	x	x		x			x*			x*	x*	x*
Least Weasel +					x*	x	x					
Long-tailed Weasel+	x	x	x	x	x*	x	x					
Mink +	x					x				x*	x*	x*
Striped Skunk +	x	x		x	x*		x*			x	x	x
White-tailed Deer +	x	x	x	x	x*		x		x	x*		

The opossum is not uncommon in the CVNRA, but due to its nocturnal habits, is seldom seen. Their distinctive tracks, however, are to be found nearly everywhere. Sometimes feeding on carrion, it is not uncommon to find them feeding on roadkills.

LOCALITIES: Fig. 35. Ritchie Ledges; east of Cuyahoga river between I-271 and the Ohio Turnpike.

CURRENT STATUS: Frequent.

ORDER: Insectivora

FAMILY: Soricidae

Masked Shrew, Sorex cinereus (Kerr)

This species is the second smallest mammal in Ohio and the smallest in the CVNRA. It was well-represented in our study. The majority of our specimens came from oldfield, meadow and shrub seral communities.

LOCALITIES: Figs. 36a, 36b. Oxbow Lake Area; Major Rd. Pine Plantation; Quick Rd. just east of Akron-Peninsula Rd.; south side of Highland Rd. near Brandywine Creek; Stumpy Basin area.

CURRENT STATUS: Infrequent.

Smoky Shrew, Sorex fumeus (Miller)

The Smoky Shrew appears to be uncommon at CVNRA, being taken at only three of our study sites.

LOCALITIES: Figs. 37a, 37b. Major Rd. Pine Plantation; Oxbow Lake area; north of Brandywine Creek north of Pipeline.

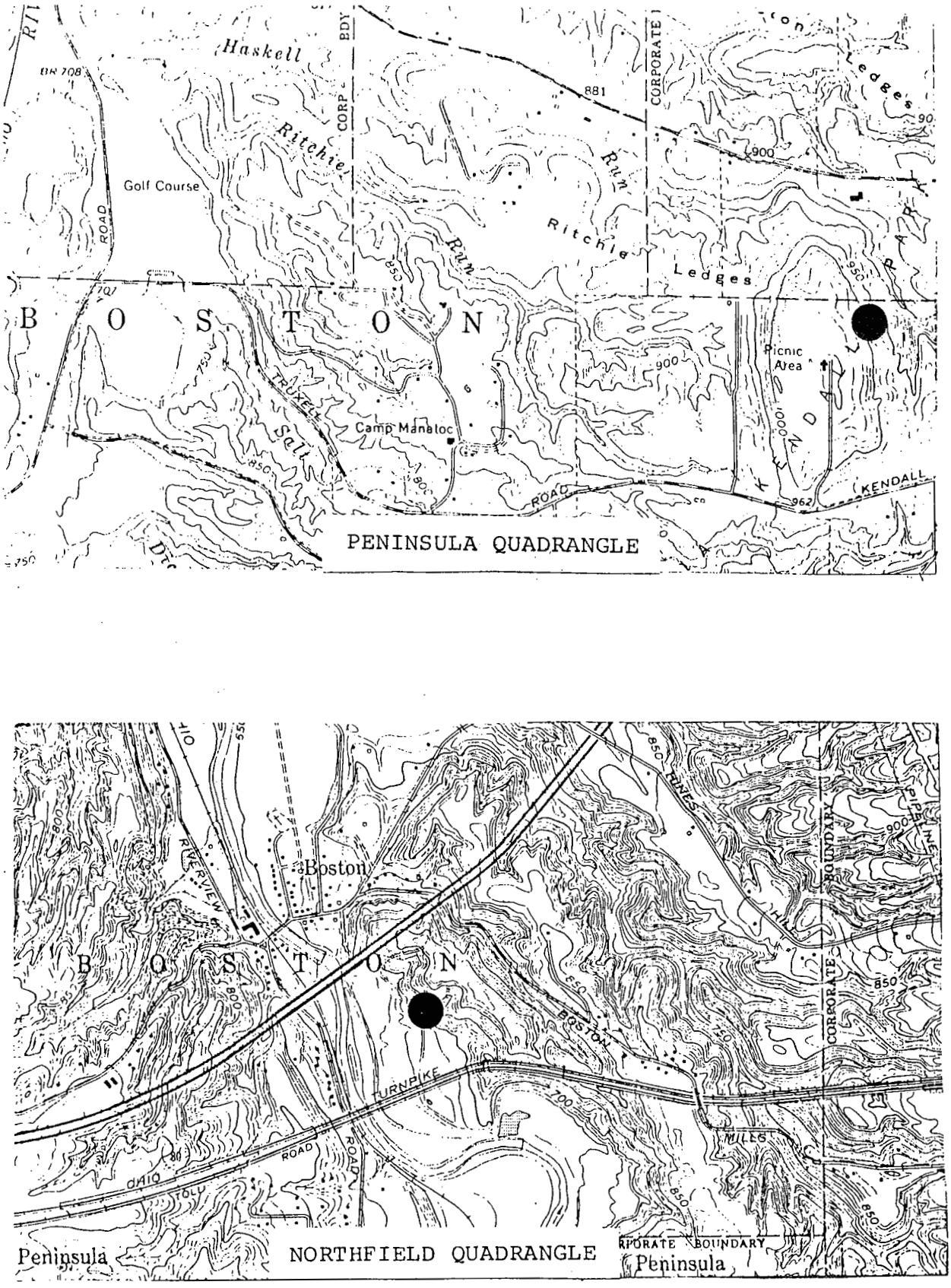


Fig. 35. Sighting localities for the Opossum.

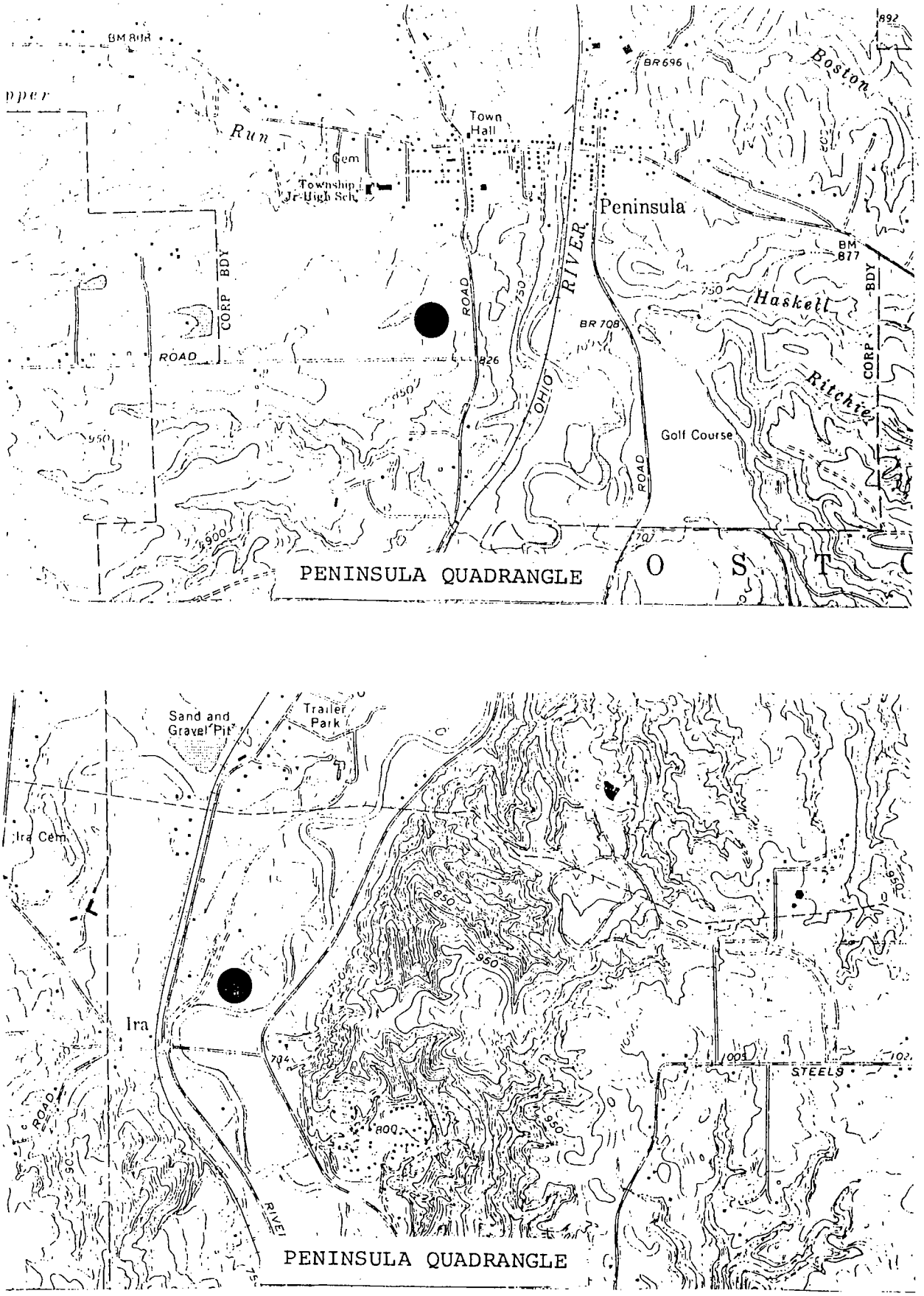


Fig. 36a. Collection sites for Masked Shrews.

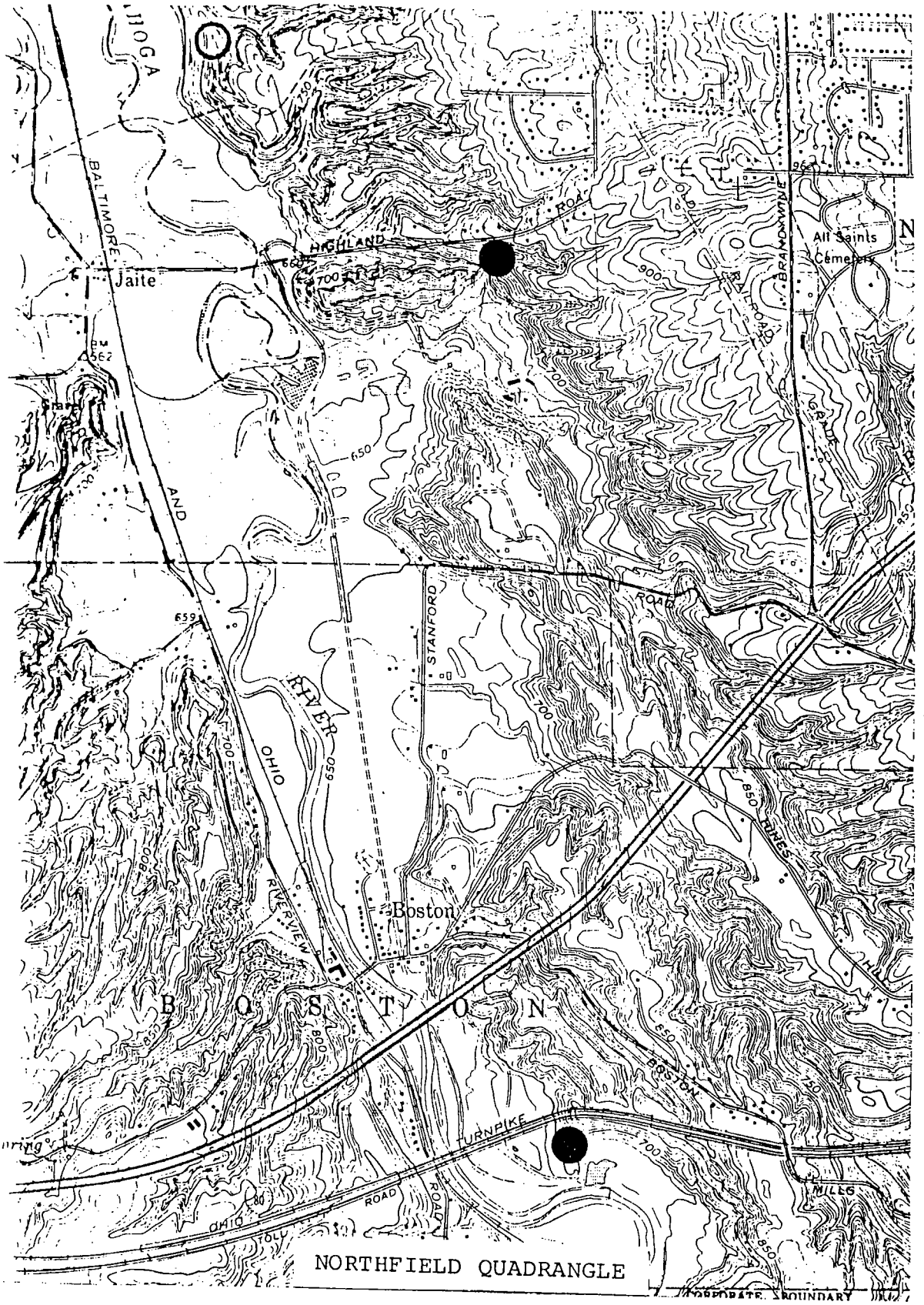


Fig. 36b. Collection sites for Masked Shrews.

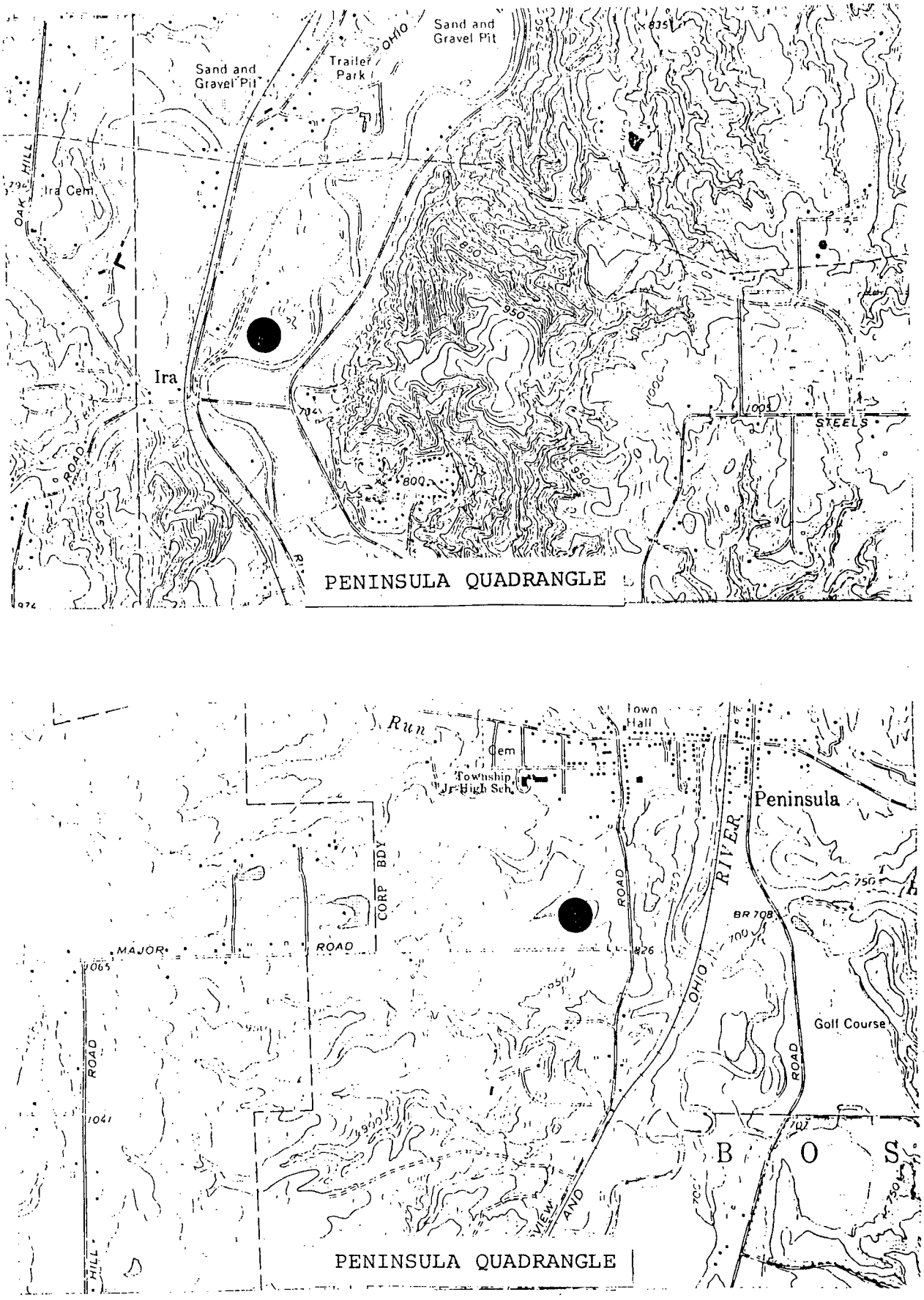


Fig. 37a. Collection sites for Smoky Shrews.

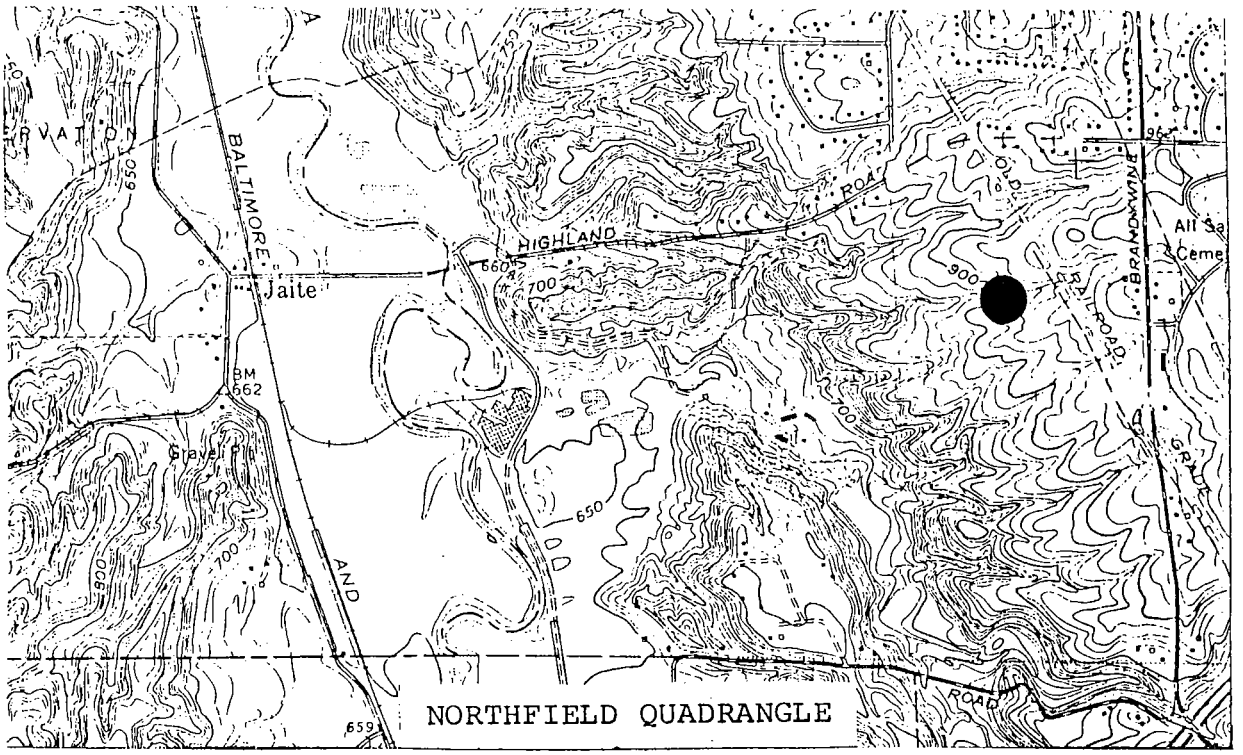


Fig. 37b. Collection sites for Smoky Shrews.

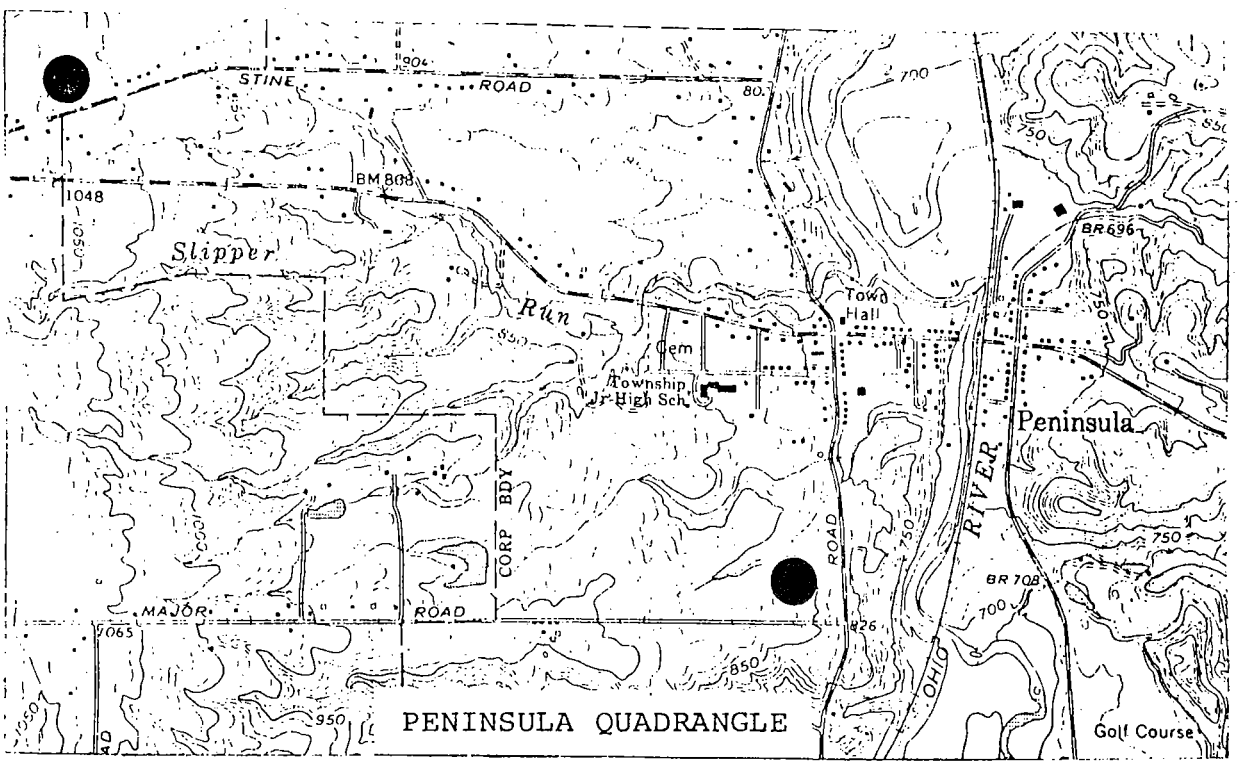


Fig. 38a. Collection sites for Short-tailed Shrews.

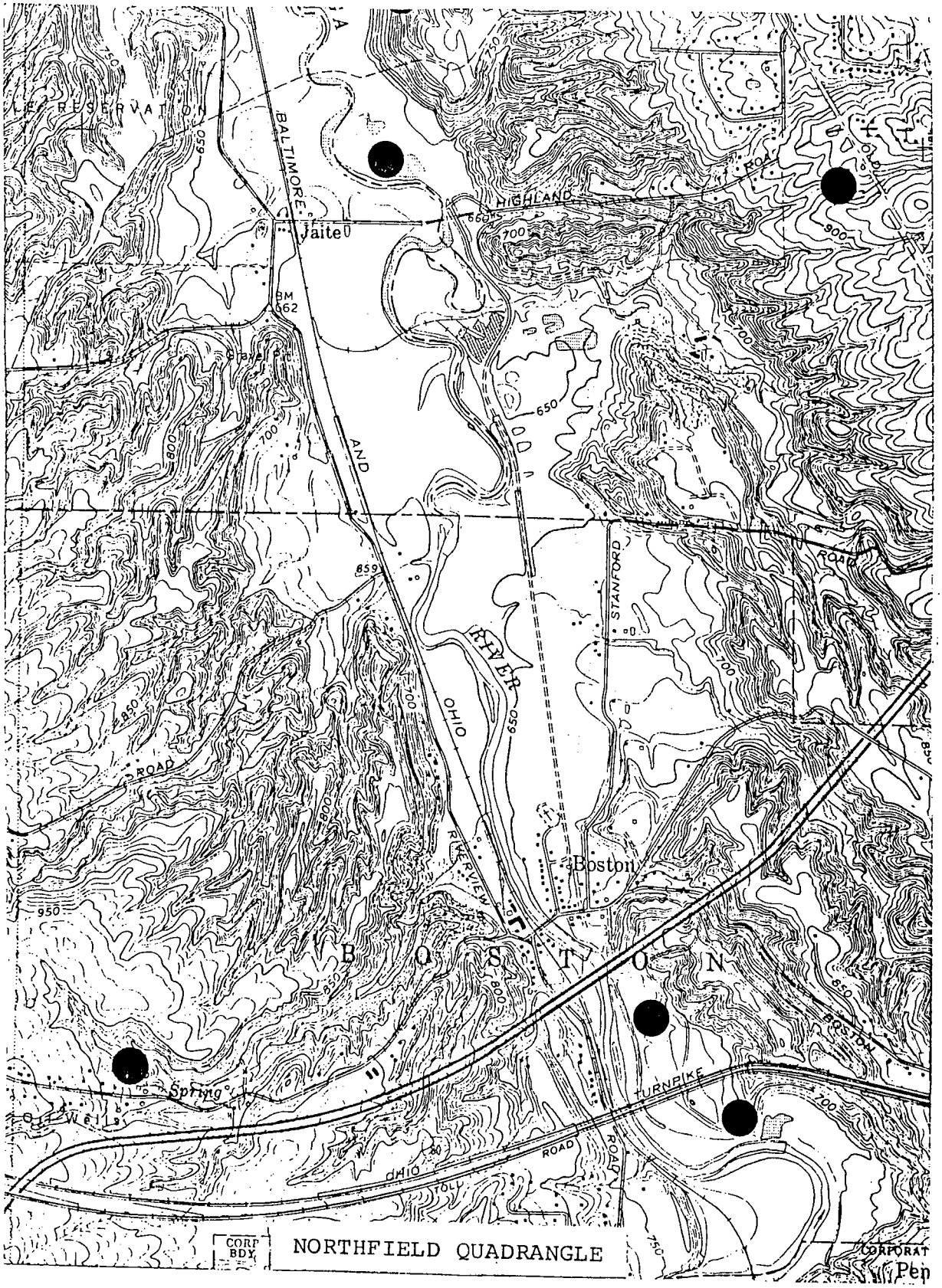


Fig. 38b. Collection sites for Short-tailed Shrews.

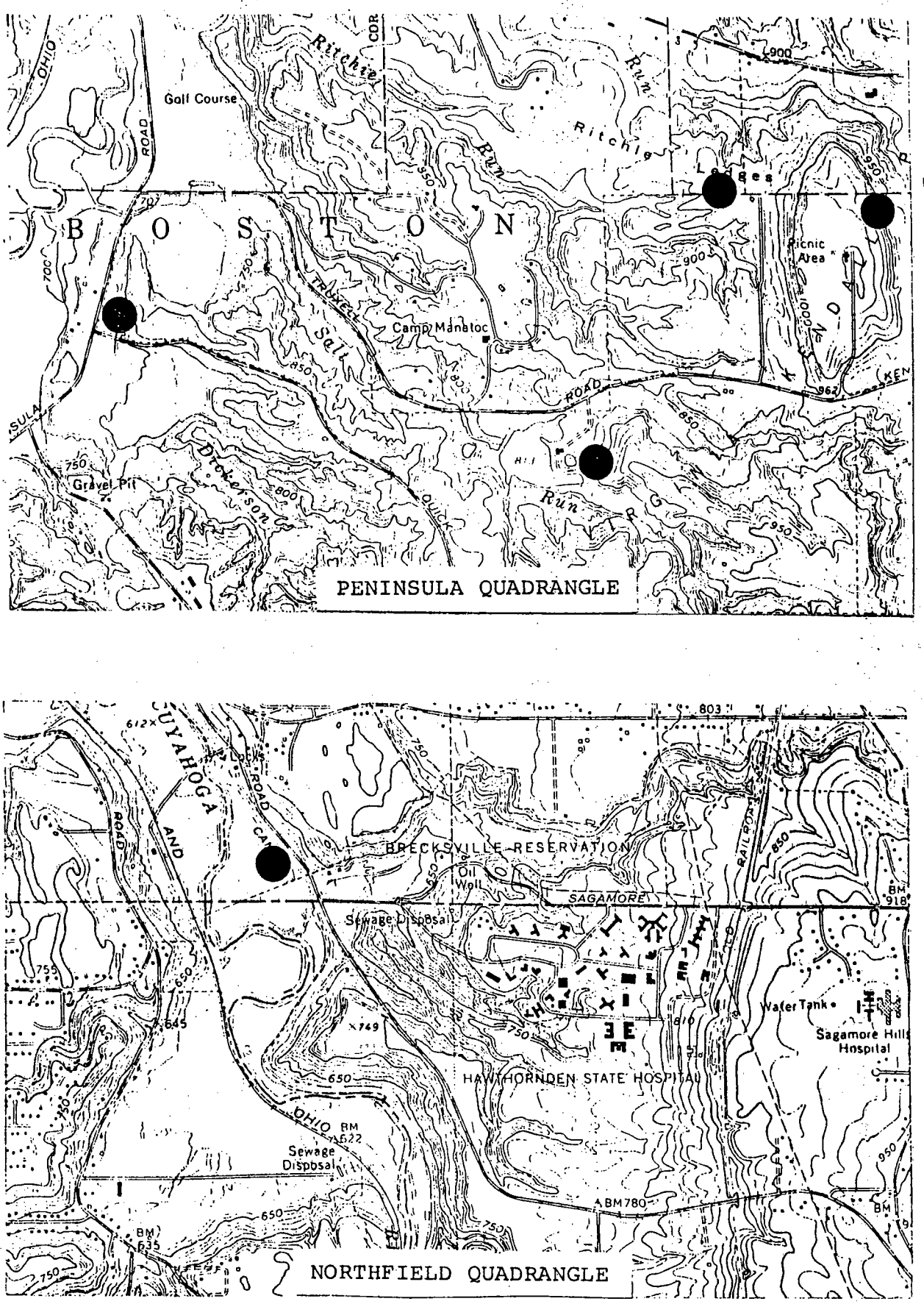


Fig. 38c. Collection sites for Short-tailed Shrews.

CURRENT STATUS: Rare.

Short-tailed Shrew, Blarina brevicauda (Say)

This animal is the most abundant mammal species in the CVNRA. It was well-represented in every one of our study sites. Many of our specimens were partially eaten by Short-tailed Shrews before we could recover them. In some of the abandoned gravel pits with sparse vegetation Short-tailed shrews represented over 80% of the small mammals taken.

LOCALITIES: Figs. 38a, 38b, 38c. Kendall Park Ledges; Kendall Lake; the Octagon; Quick Rd. near Akron-Peninsula Rd.; Major Rd. Pine Plantation; between Stine Rd. and I-271; Boston Hills Rd. near waterfall; Brandywine Creek off Highland Rd.; Valleyview Rd. near the Ohio Canal; west of R.R. grade south of Highland Rd.; east of Northampton Rd. near source of Langes Run; east of Cuyahoga River-between turnpike and I-271; north of Wheatley Rd. 0.5 mile east of Revere Rd.; north of Hillside Rd. at Cuyahoga River; Stumpy Basin.

CURRENT STATUS: Common.

FAMILY: Talpidae

Hairy-tailed Mole, Parascalops breweri (Bachman)

The tunnels of this species are fairly common in upland areas of the park, but we were successful in taking specimens of this animal at only two locations.

LOCALITIES: Fig. 39. Field along the Ohio Turnpike above Stumpy

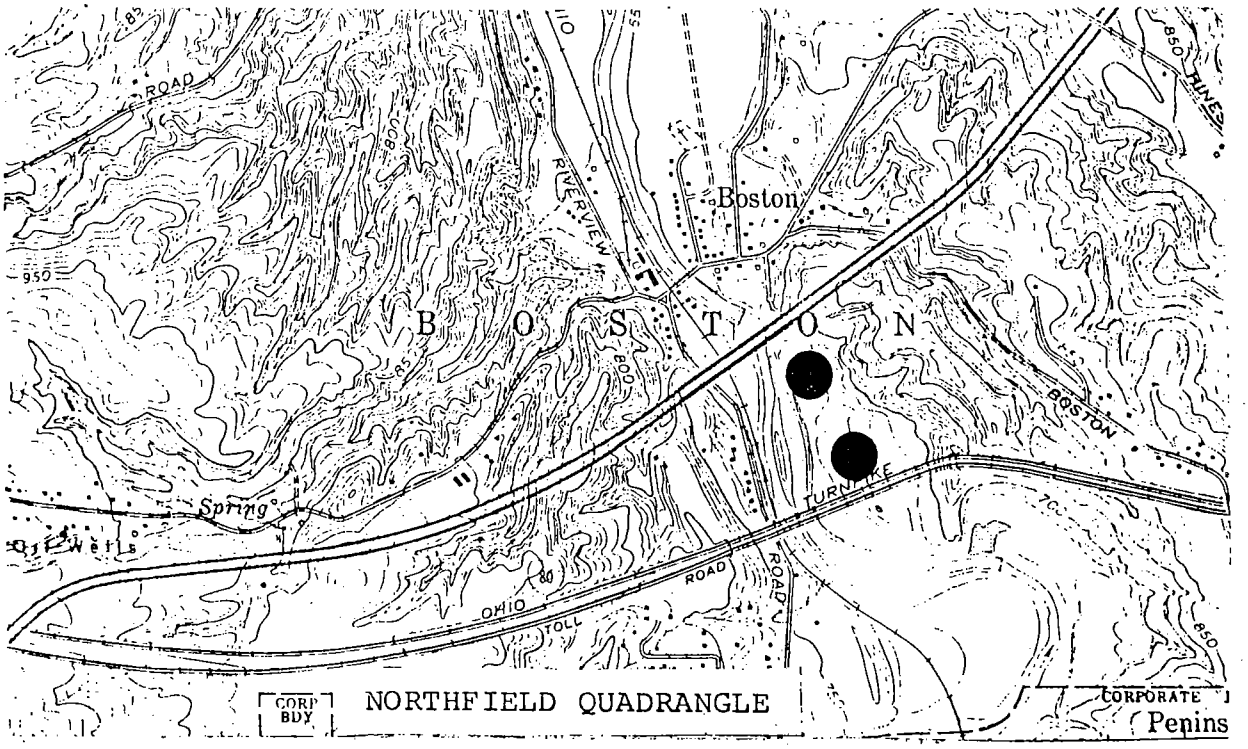


Fig. 39. Collection sites for Hairy-tailed Moles.

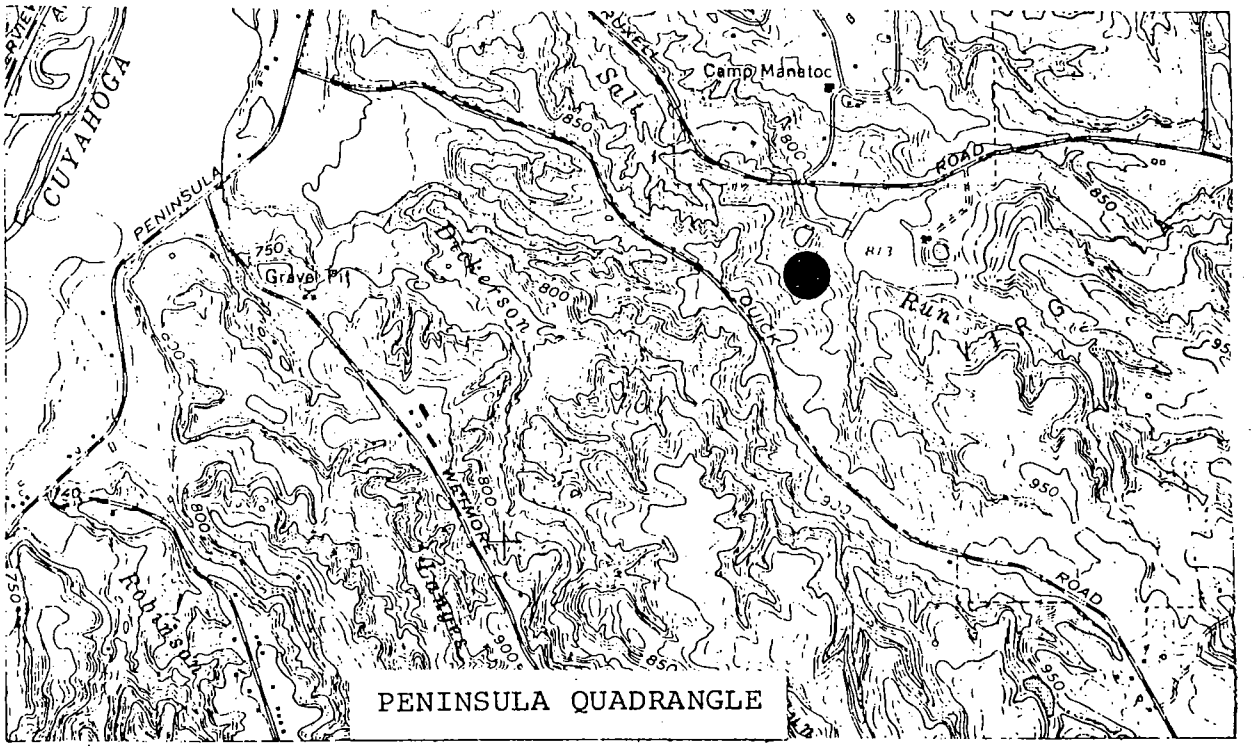


Fig. 40. Collection site for the Eastern Mole.

Basin, Between I-271 and the Ohio Turnpike along the east side of the Cuyahoga River.

CURRENT STATUS: Infrequent.

Eastern Mole, Scalopus aquaticus (Rafinesque)

Only one specimen of this species was taken at the edge of a grassy field, west side of Kendall Lake.

LOCALITY: Fig. 40. Kendall Lake.

CURRENT STATUS: Rare.

Star-nosed Mole, Condylura cristata (Linnaeus)

This mole is much more common in wet marshy areas than either of the above two species, and often swims underwater.

LOCALITIES: Figs. 41a, 41b. Stumpy Basin; Kendall Lake-marshy area near entrance off Kendall Park Rd.; Oxbow Lake area.

CURRENT STATUS: Infrequent.

ORDER: Chiroptera

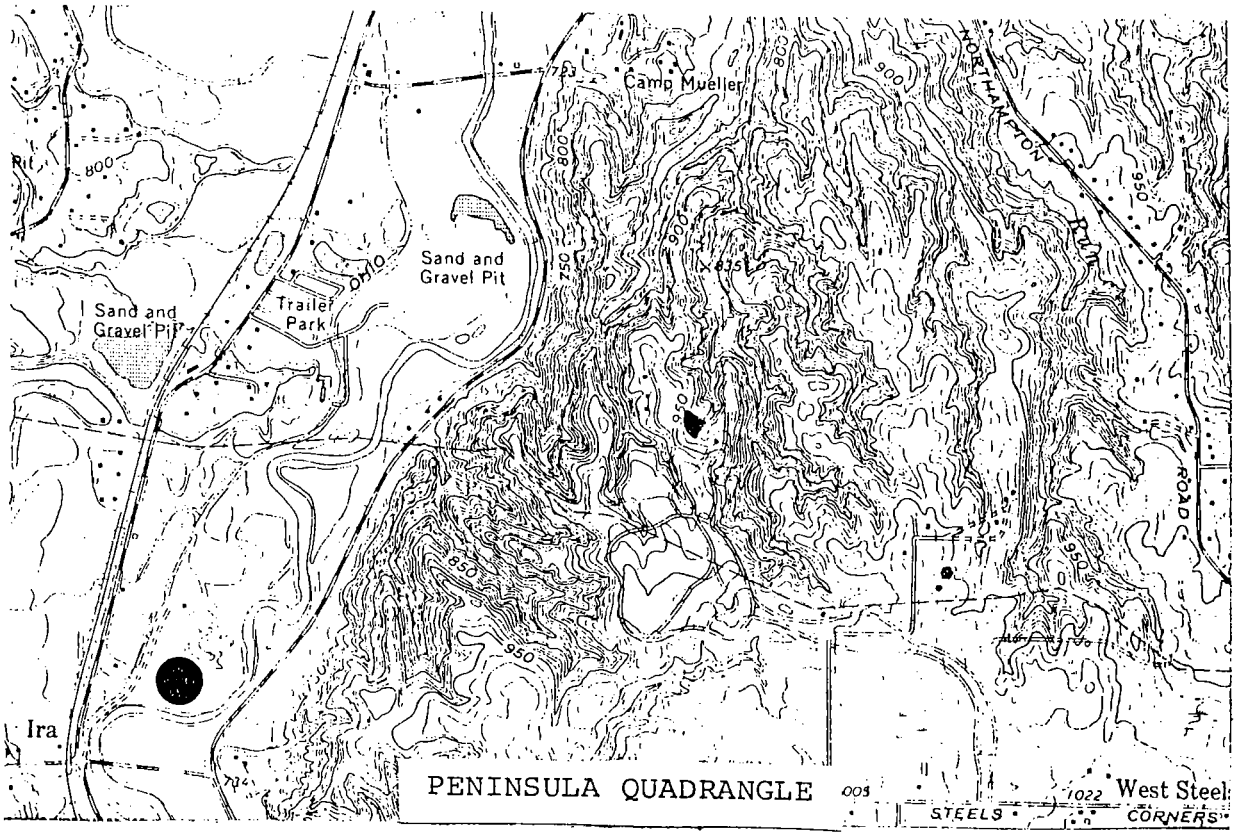
FAMILY: Vespertilionidae

Little Brown Myotis (Little Brown Bat), Myotis lucifugus (LeConte)

We were able to capture specimens of this bat only three times at two locations.

LOCALITIES: Fig. 42. Red barn in Boston Mills; brown barn on Stanford Rd.

CURRENT STATUS: Infrequent.



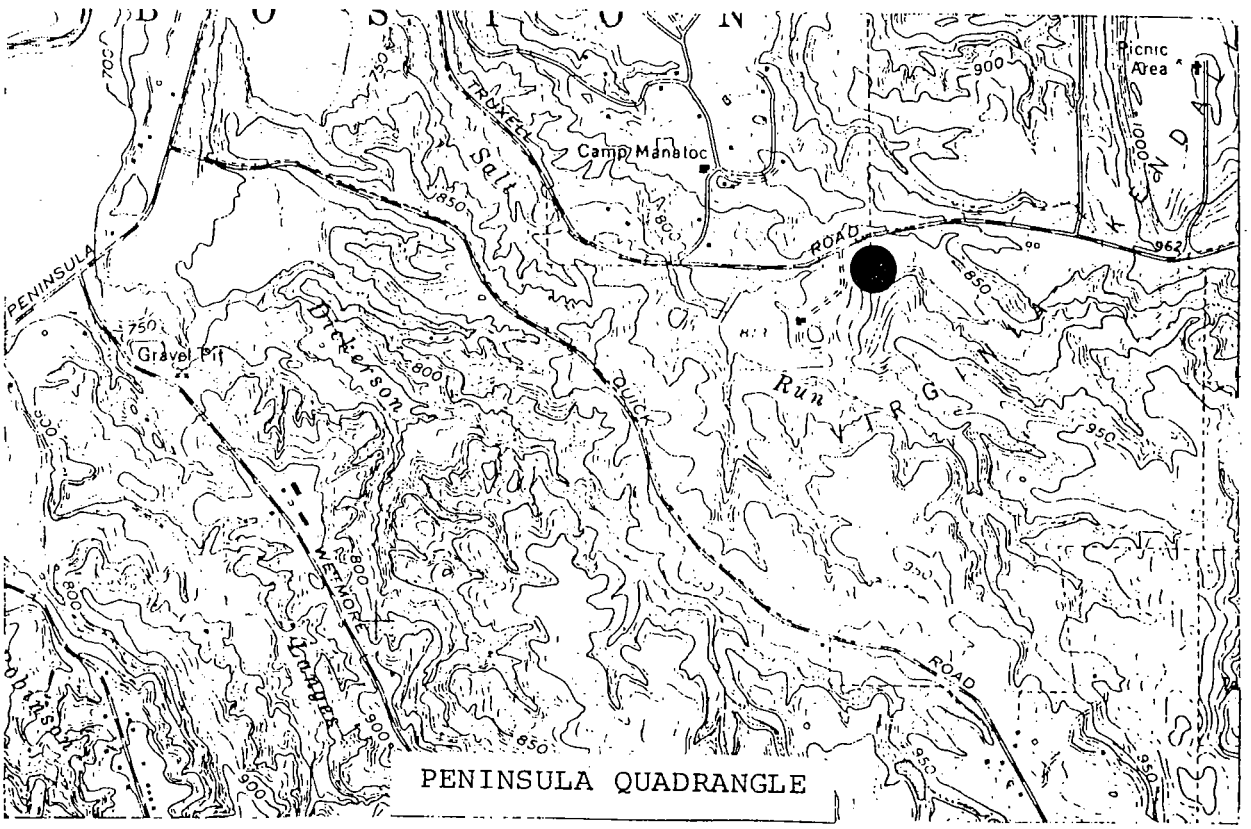


Fig. 41a. Collection sites for Star-nosed Moles.

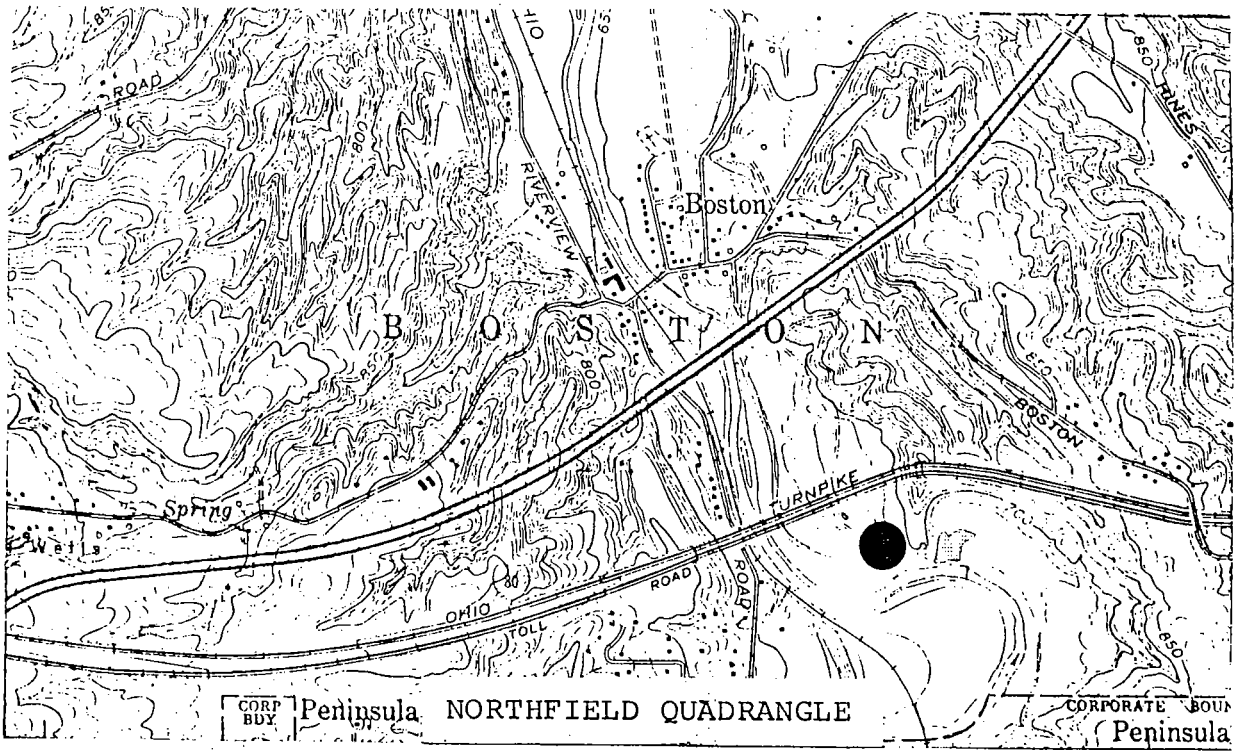


Fig. 41b. Collection site for the Star-nosed Mole.

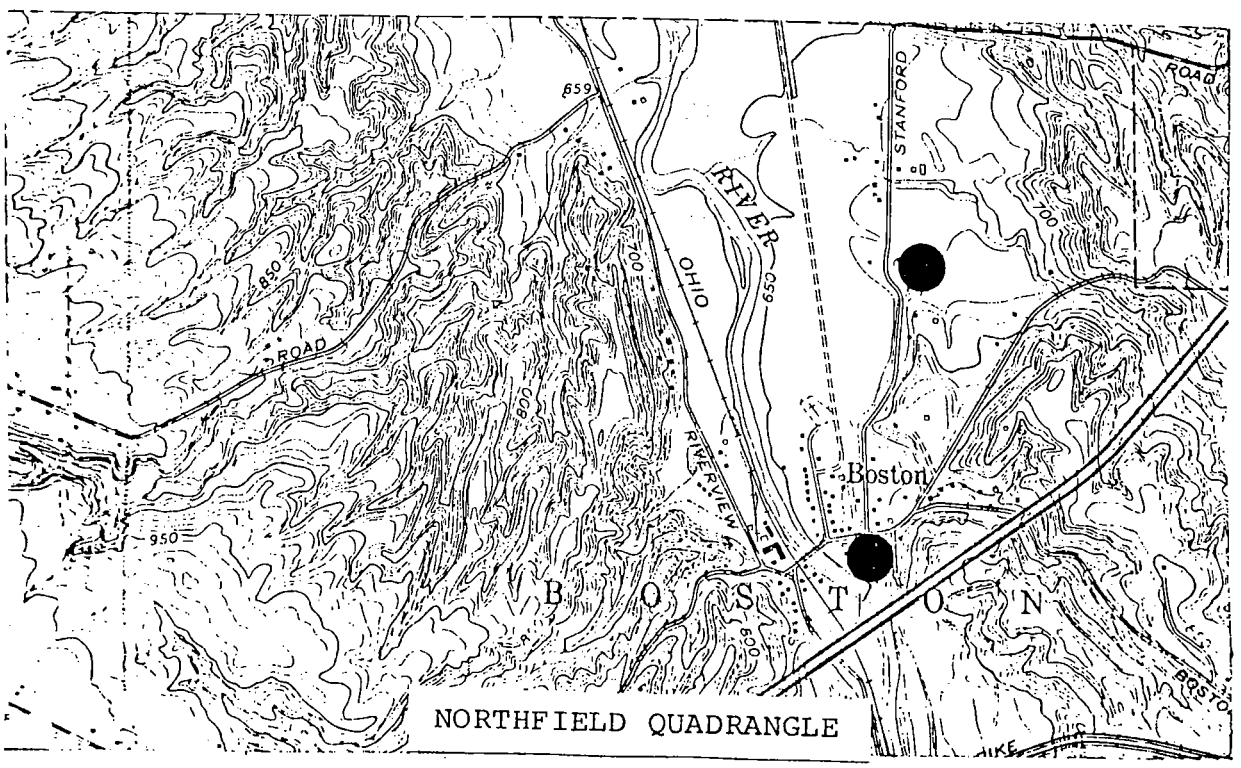


Fig. 42. Collection site for the Little Brown Myotis.

Big Brown Bat, Eptesicus fuscus (Palisot de Beauvois)

This large bat does not migrate and was quite common in the old abandoned barns and outbuildings in the CVNRA.

LOCALITIES: Fig. 43. Ranger Station barn on Riverview Rd.; red barn at Boston Mills; brown barn on Stanford Rd.

CURRENT STATUS: Frequent; probably the most abundant bat at CVNRA.

ORDER: Lagomorpha

FAMILY: Leporidae

Eastern Cottontail (Cottontail Rabbit), Sylvilagus floridanus (J.A. Allen)

The Eastern Cottontail was not as abundant on CVNRA lands as we expected. This may simply represent a low in a population cycle or it may be indicative of the absence of agriculture over much of the abandoned farmlands. The rabbit population may therefore increase as the oldfield plant communities give way to the shrub seral/bramble stage of development.

LOCALITIES: Figs. 44a, 44b. Oxbow Lake Area; Quick Rd. near Akron-Peninsula Rd.; Major Rd. Pine Plantation; Boston Mills Rd. 1 mile west of Akron-Peninsula Rd.

CURRENT STATUS: Infrequent, but locally more abundant.

ORDER: Rodentia

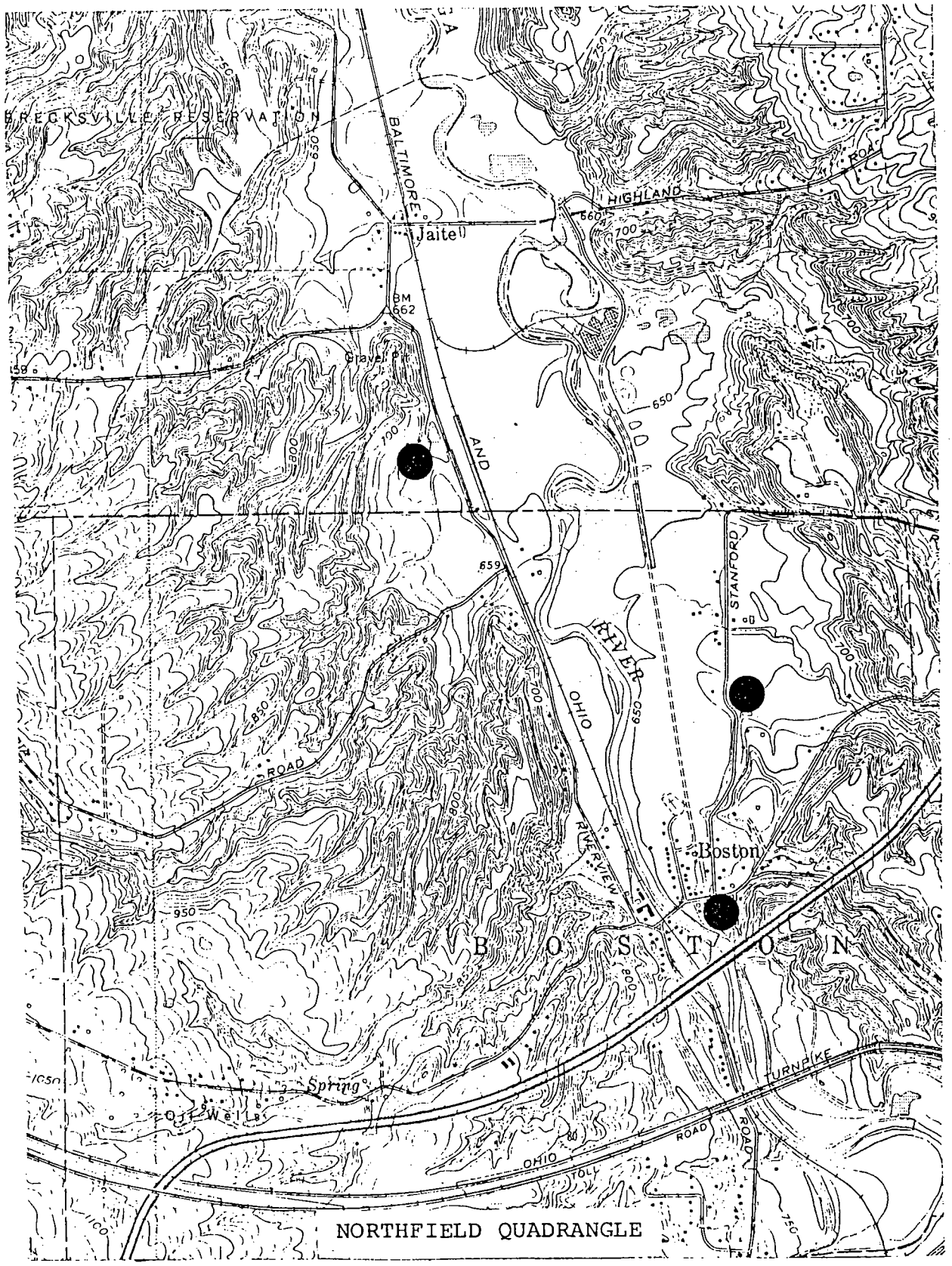
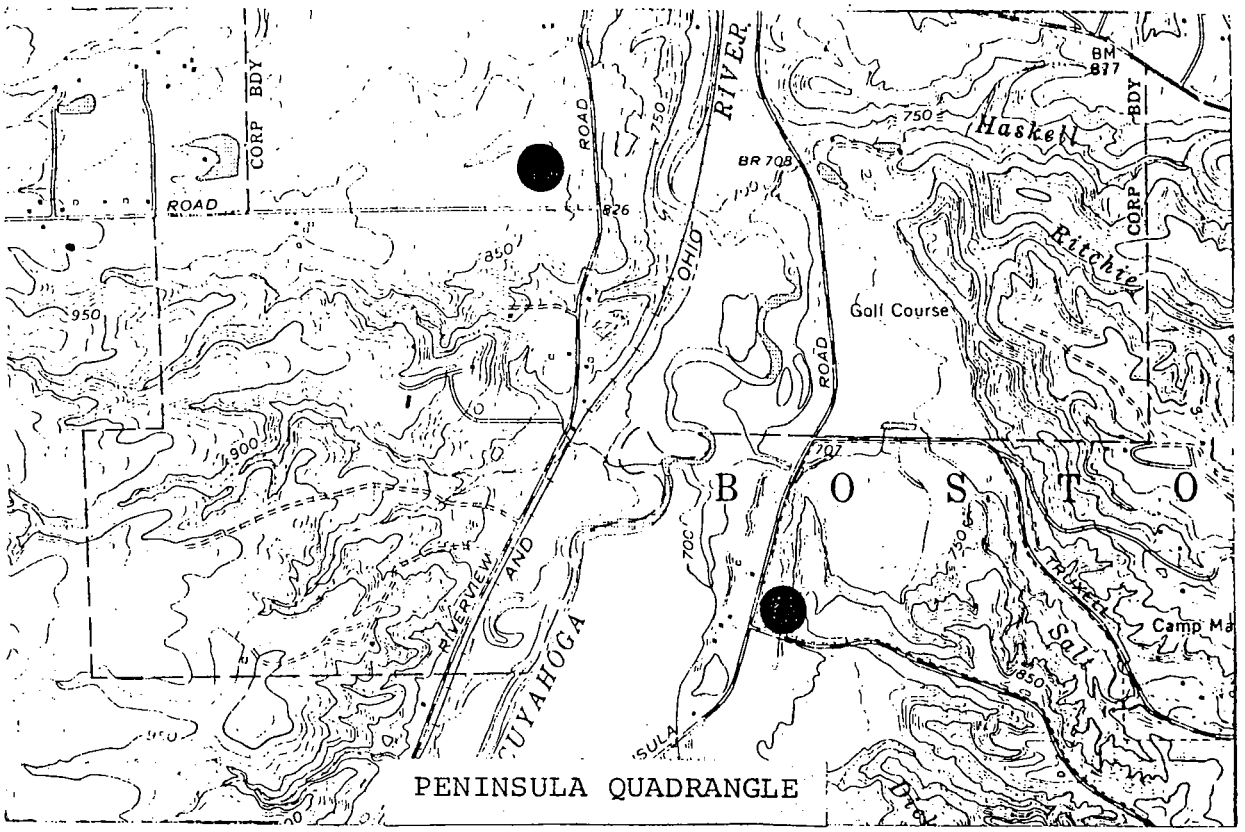


Fig. 43. Collection sites for the Big Brown Bat.



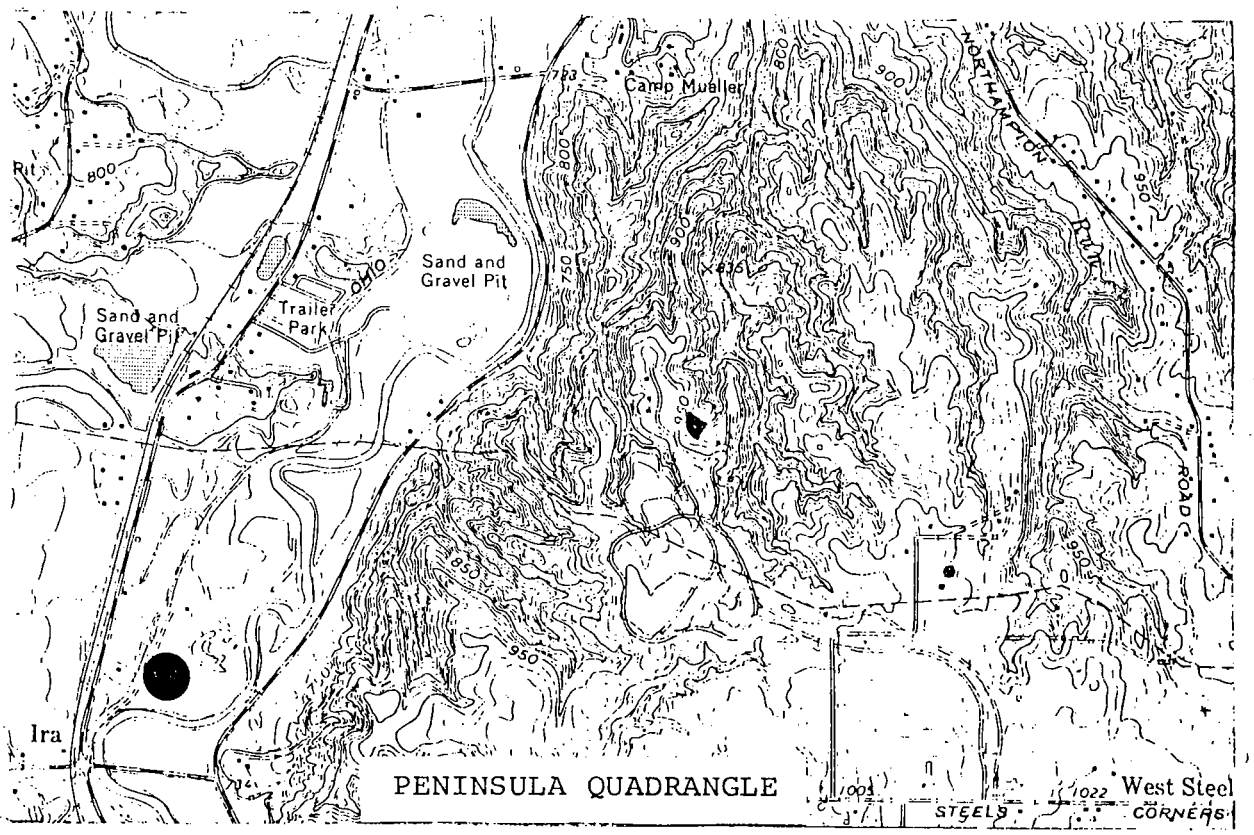


Fig. 44a. Sighting localities for the Cottontail.

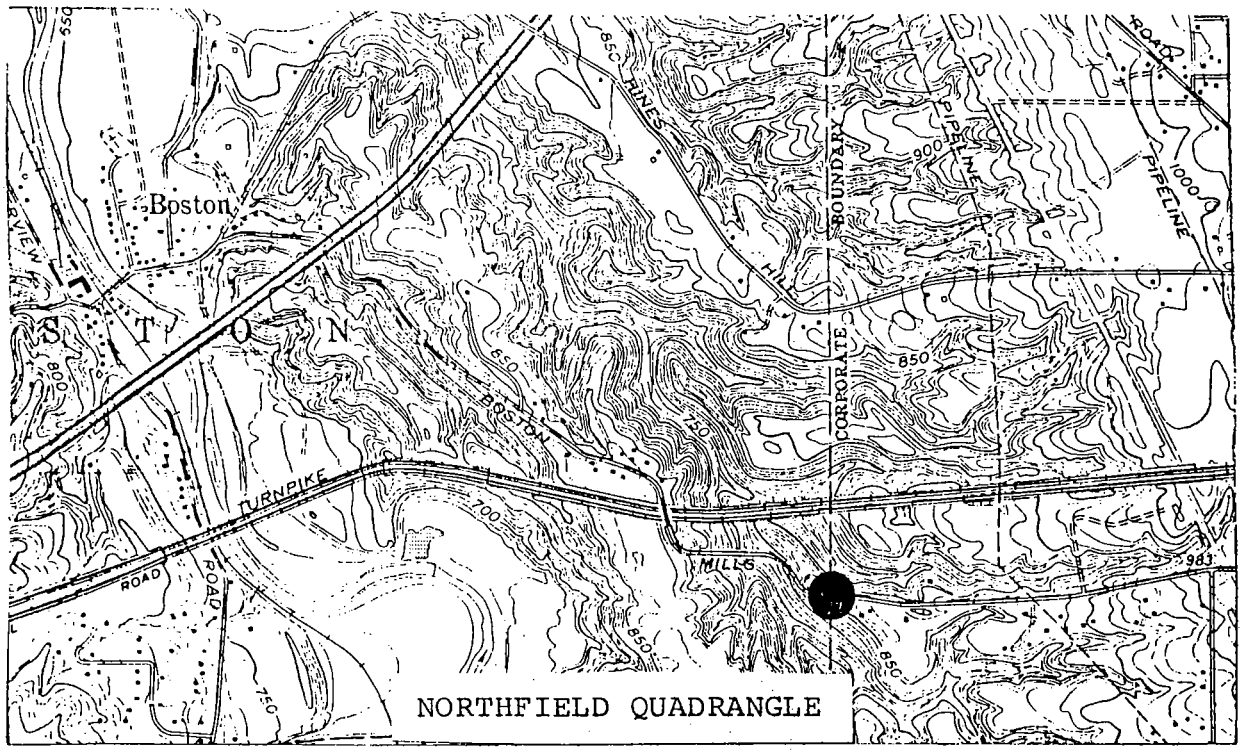


Fig. 44b. Sighting locality for the Cottontail.

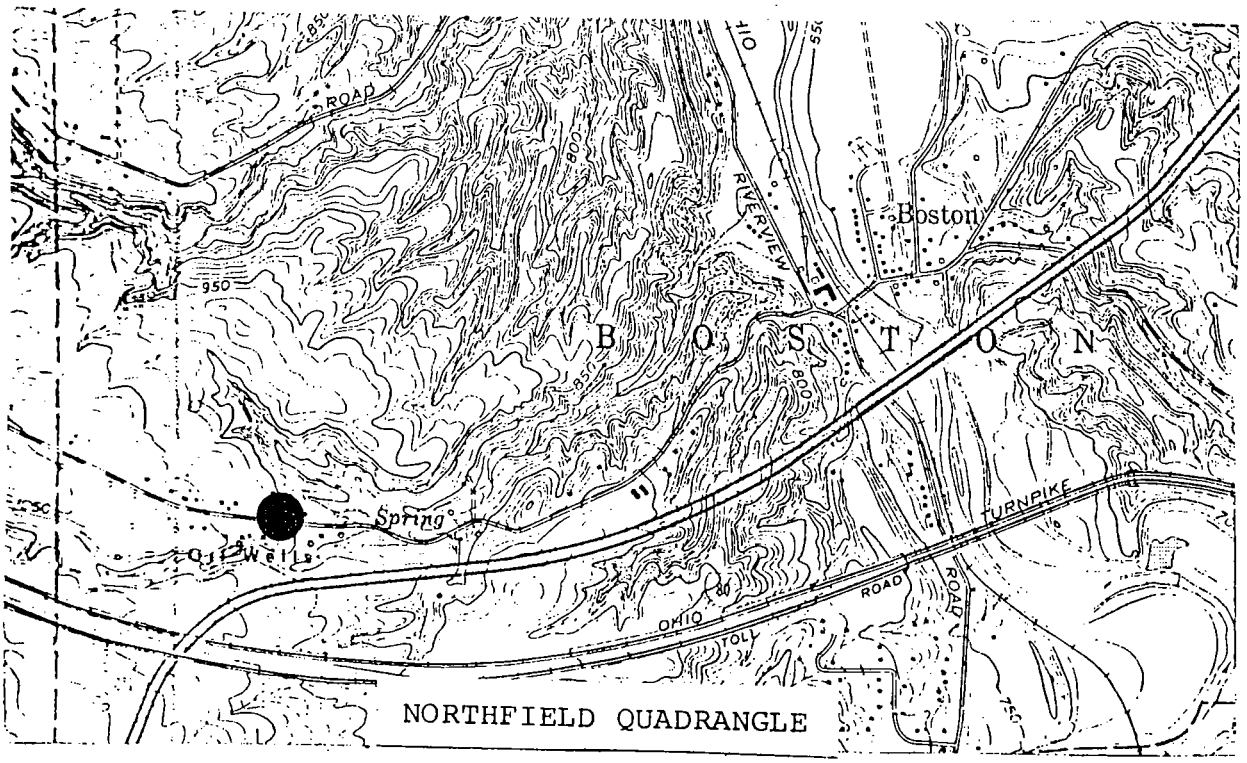


Fig. 45a. Locality of Eastern Chipmunks.

FAMILY: Sciuridae

Eastern Chipmunk, Tamias striatus (Linnaeus)

This attractive little animal is probably the most commonly seen and heard mammal in the park. They are often quite tame in the picnic areas, where they may become pests.

LOCALITIES: Figs. 45a, 45b, 45c. Ice Box trail and picnic areas Kendall Park; Kendall Lake; Quick Rd. 0.5 mile east of Akron-Peninsula Rd.; 0.5 mile north of Everett along Riverview Rd.; Oxbow; Furnace Run near Wheatley Rd. bridge; Boston Mills Rd. 1.5 mile west of Riverview Rd. (roadkill).

CURRENT STATUS: Common.

Woodchuck (Groundhog), Marmota monax (Linnaeus)

This is our largest member of the squirrel family and our second largest rodent. Their numerous burrows, while dangerous to horses, when they occur along bridle paths, offer many of our other mammals and even a few birds safe refuge from severe weather. Often seen along the park roads in the early summer where they may be attracted by the presence of roadsalt, they are sometimes killed by passing automobiles.

LOCALITIES: Fig. 46. Kendall Park, Kendall Lake; the Octagon; Akron-Peninsula Rd. 1 mile south of Peninsula (roadkill); Riverview Rd. near Deep Lock Quarry Park (roadkill); Oak Hill Rd. 1 mile south of Major Rd. (roadkill); Boston Mills Rd. 0.25 mile east of I-271); Along Columbia Run; north of Highland Rd.; at Cuyahoga River.

CURRENT STATUS: Frequent.

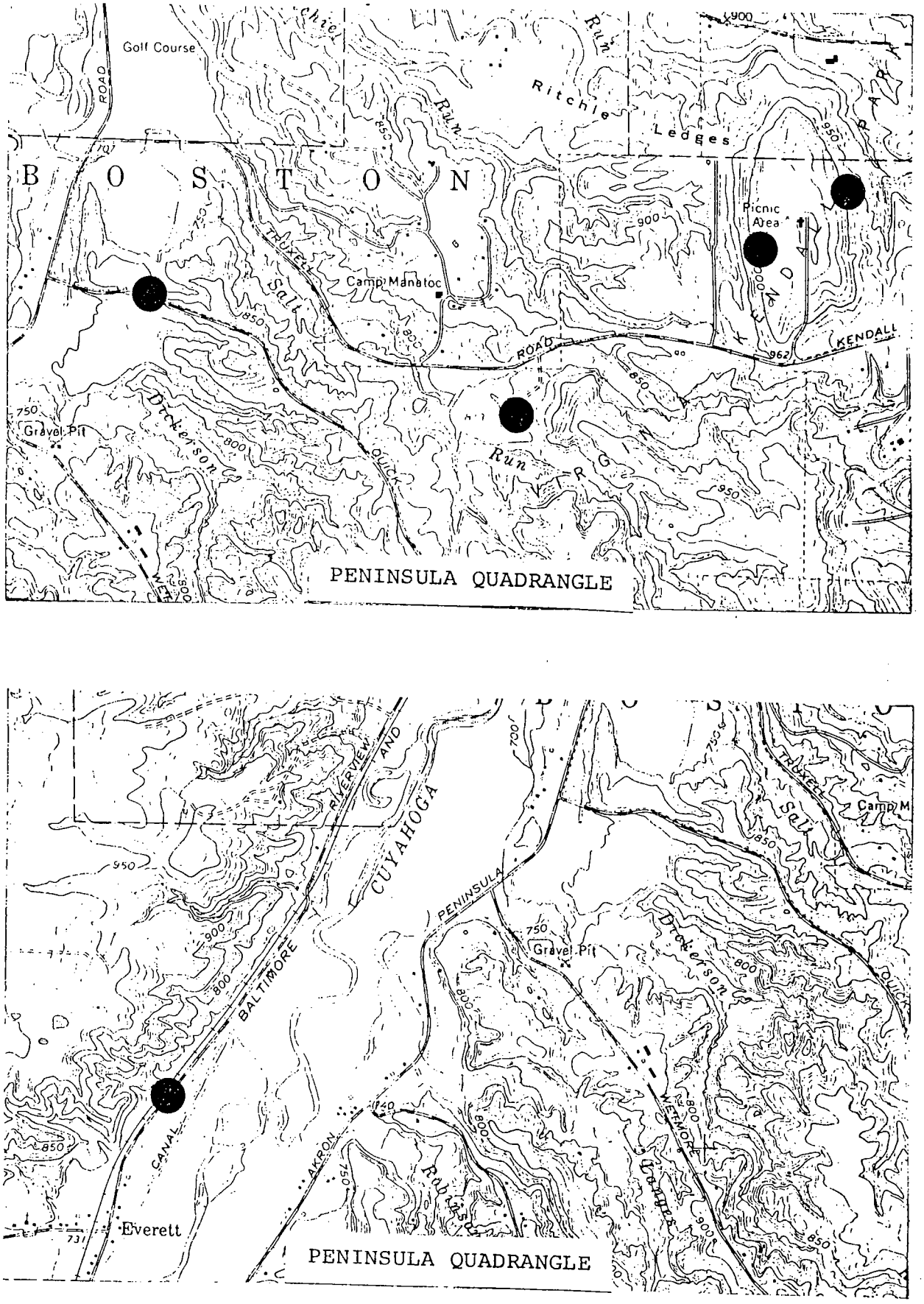


Fig. 45b. Localities of Eastern Chipmunks.

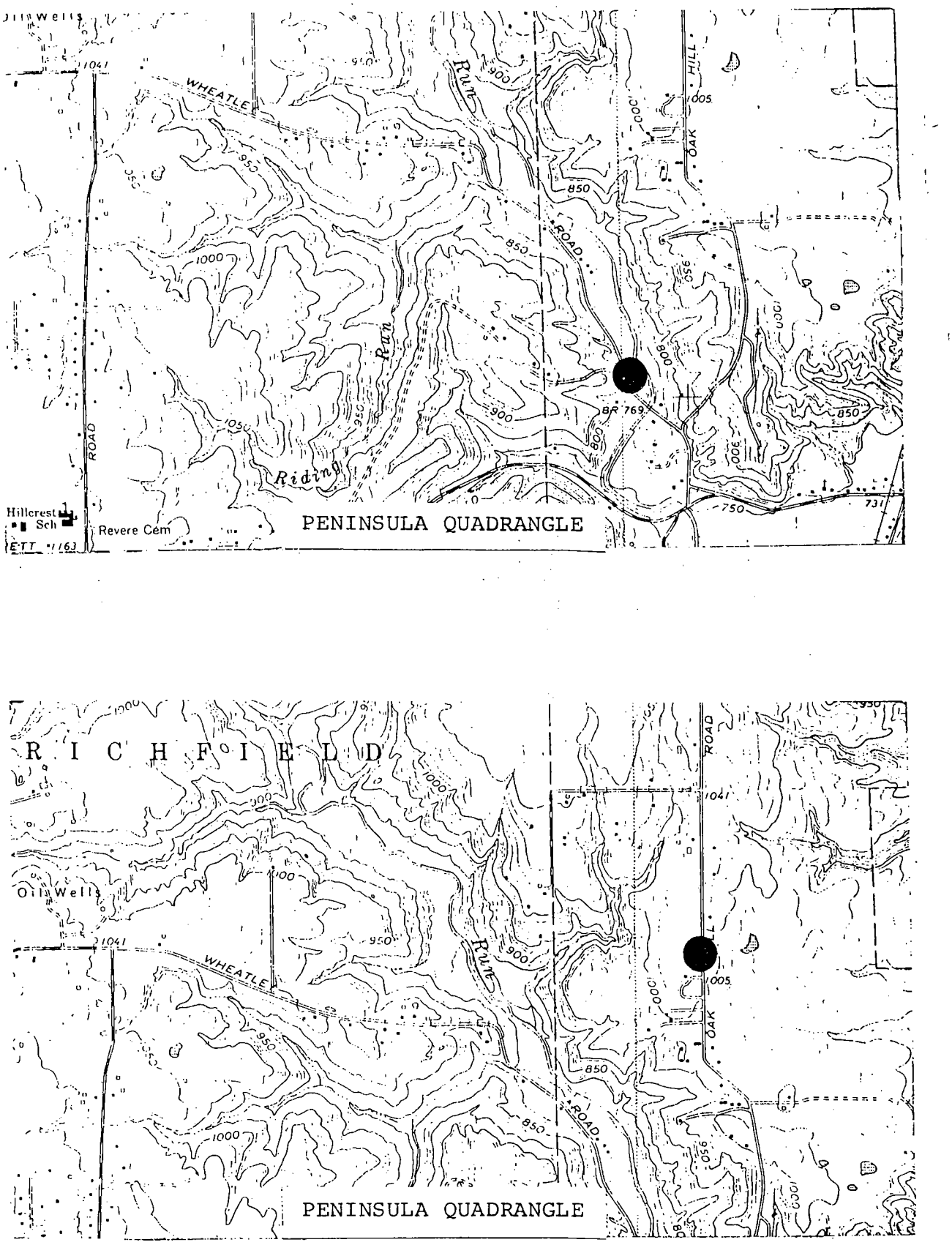
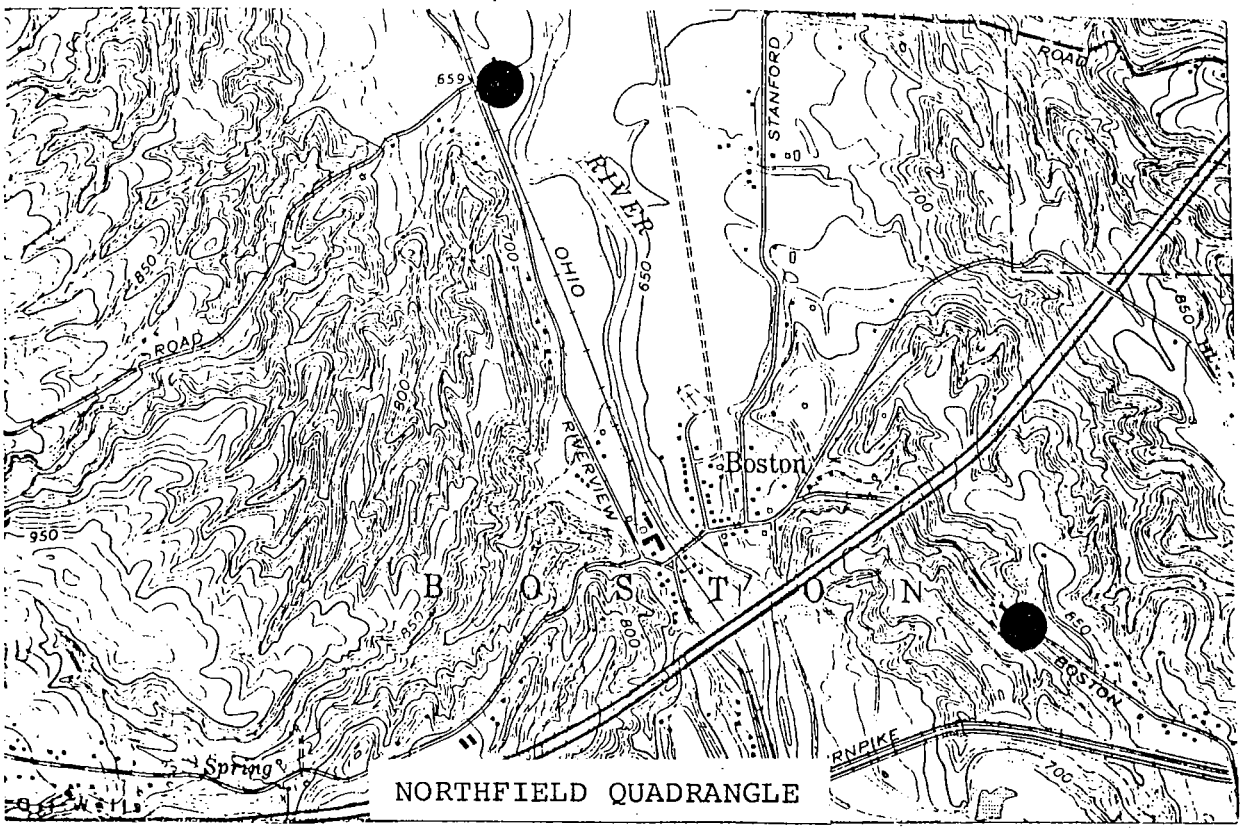


Fig. 45c. Localities of Eastern Chipmunks.



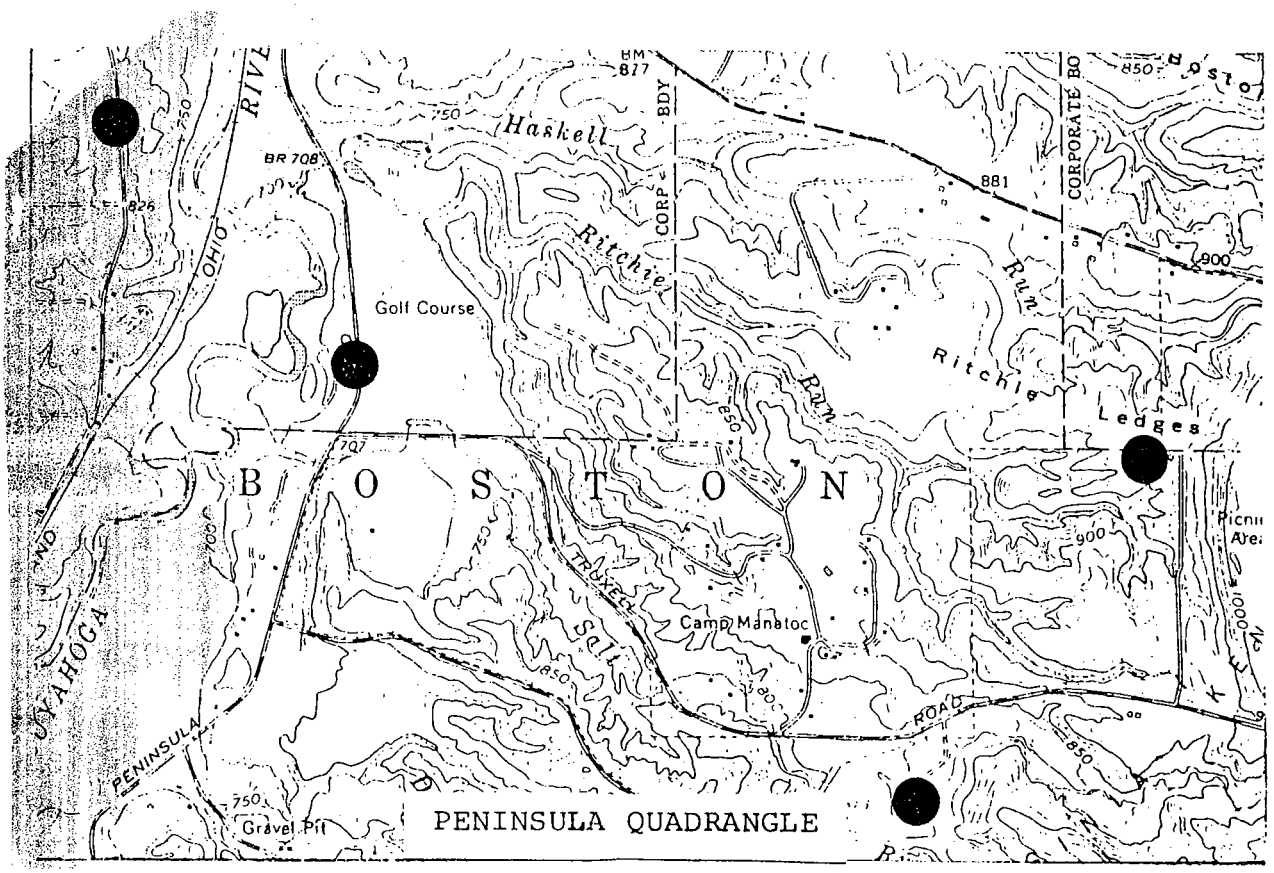


Fig. 46. Sighting localities of Woodchucks.

Gray Squirrel (Eastern Gray Squirrel), Scuirus carolinensis (Gmelin)

This species and the Fox Squirrel are quite important in the life cycle of several species of nut bearing trees. The seeds, or nuts, often freeze or dry out unless stratified or buried by squirrels. Both the Gray and Fox Squirrels are scatter hoarders and bury nuts for winter at random over the forest floor.

LOCALITIES: Figs. 47a, 47b. The Octagon; Quick Rd. 1.5 mile east of Akron-Peninsula Rd.; Oakhill Rd. near the Oak Hill Center; Stanford Rd. near I-271 bridge.

CURRENT STATUS: Infrequent, but likely to increase as the many stands of young hardwoods in the CVNRA reach maturity.

Fox Squirrel, Sciurus niger (Linnaeus)

Like the Gray, the Fox squirrel is a tree squirrel whose habit of scatter hoarding or burying nuts is probably important to several of our forest tree species. Likely to be found in more open or scattered woodlots than the Gray Squirrel, the Fox Squirrel seems to be increasing in abundance in our area.

LOCALITIES: Figs. 48a, 48b. North of the Happy Days Center; Riverview Rd. just south of the Ohio Turnpike bridge; north of Hines Hill Rd. along old railroad grade; Boston Mills Rd. 1 mile west of Akron-Peninsula Rd.

CURRENT STATUS: Infrequent, but seems to be increasing in number over the last several years.

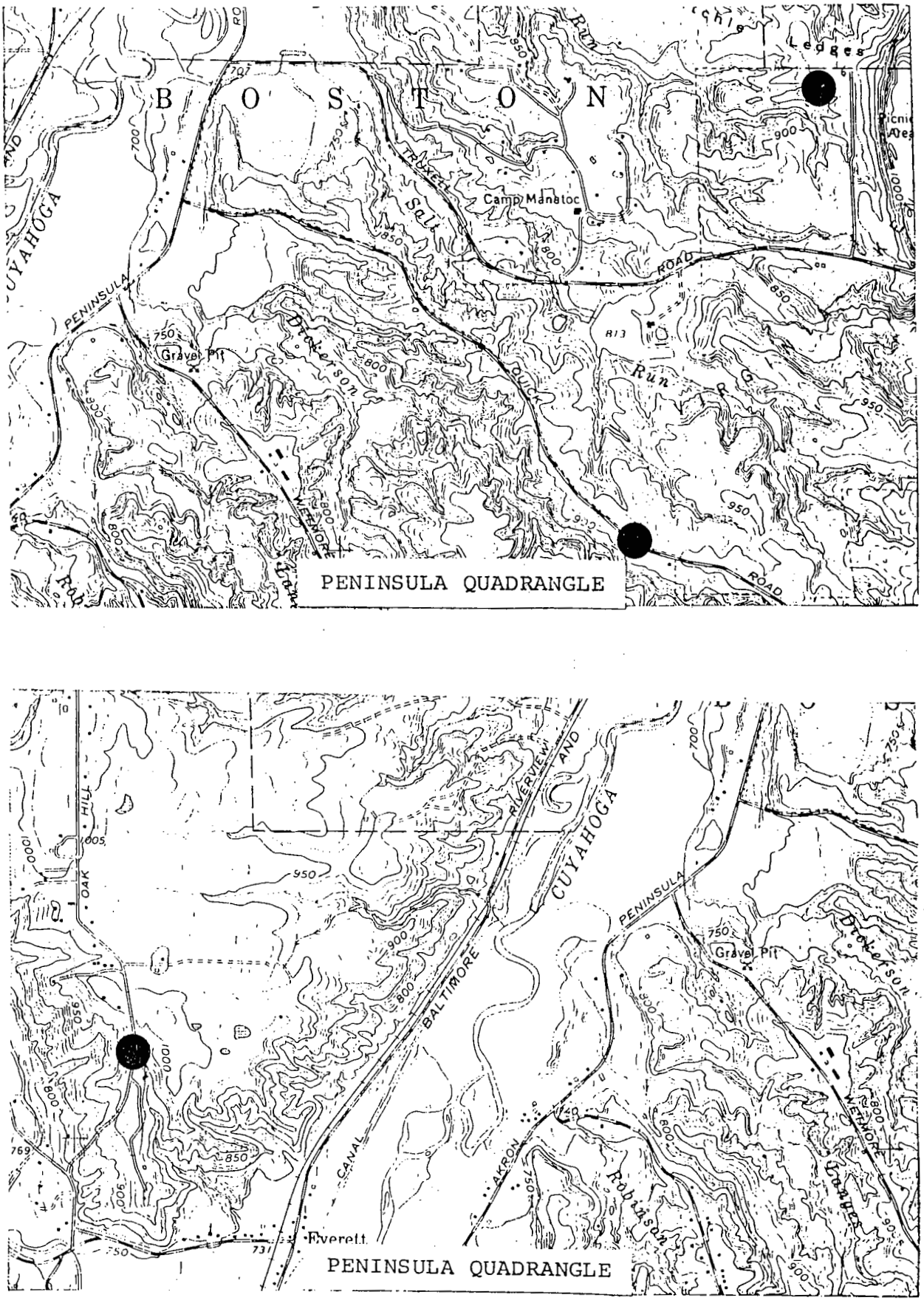


Fig. 47a. Sighting localities for Gray Squirrels.

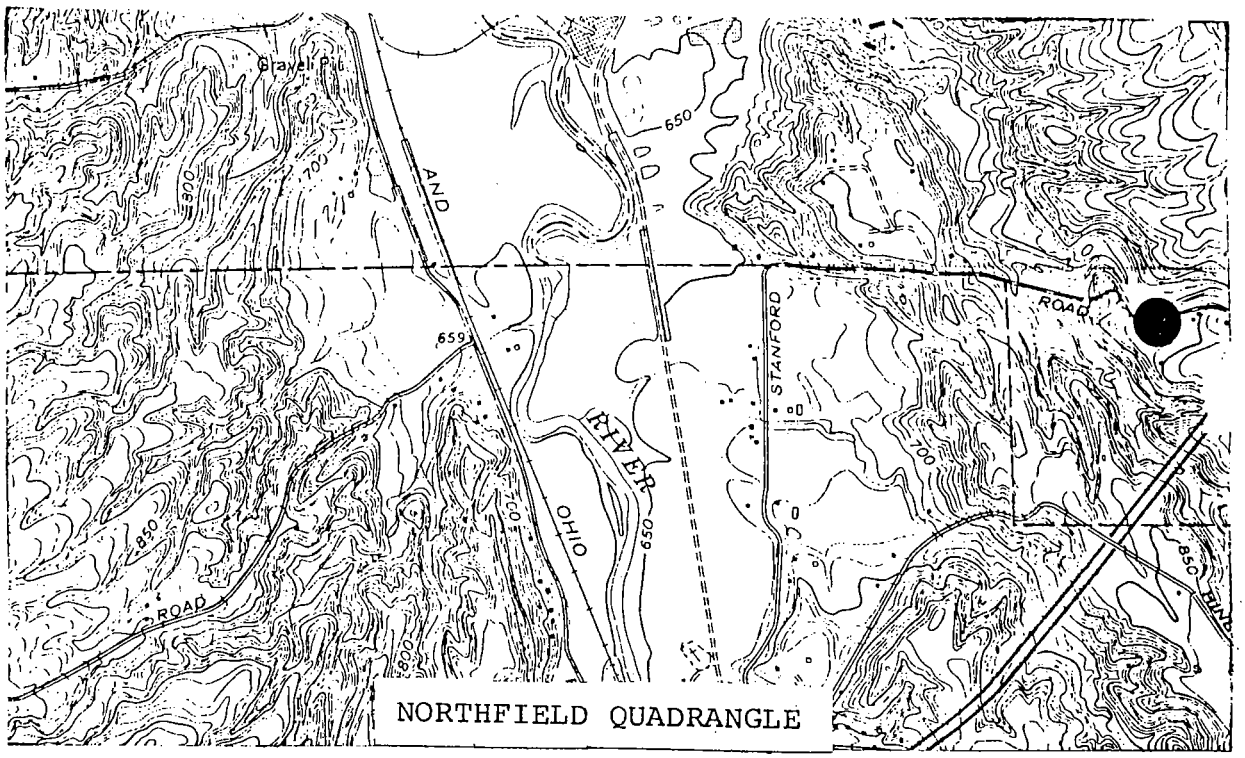


Fig. 47b. Sighting locality for the Gray Squirrel.

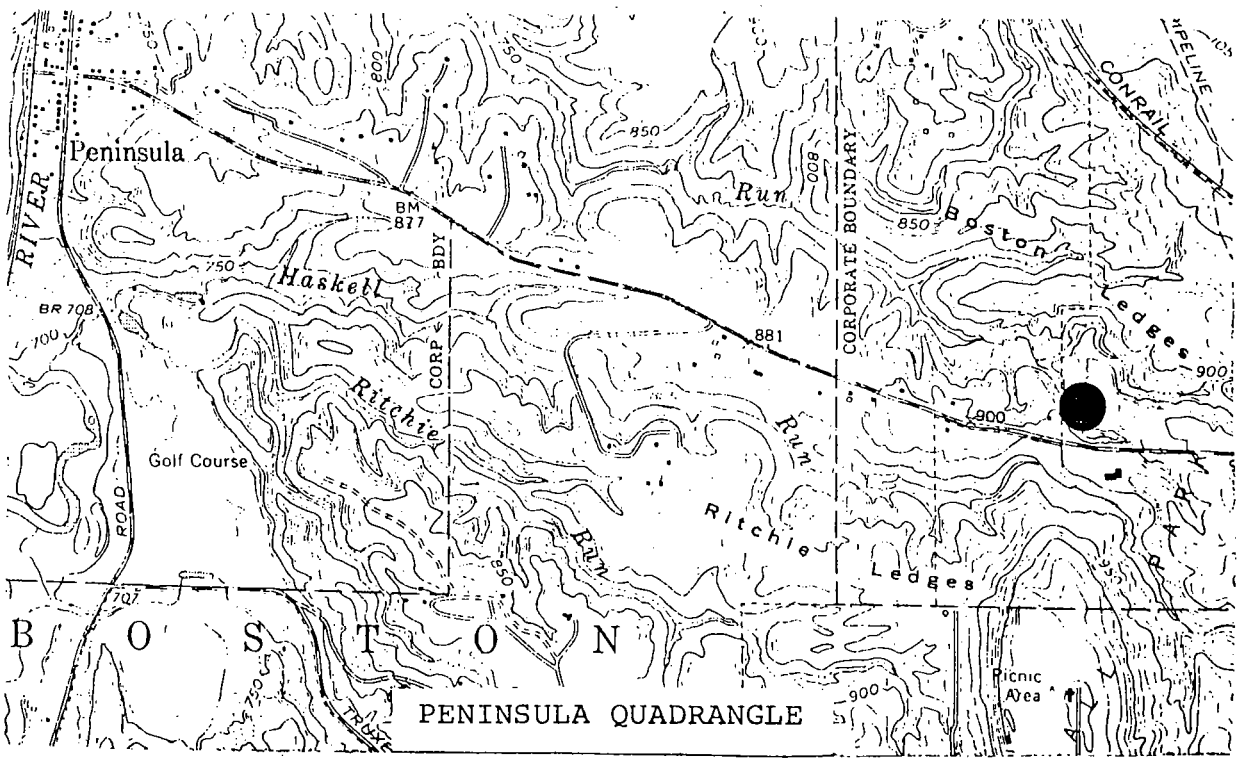


Fig. 48a. Sighting locality for the Fox Squirrel.

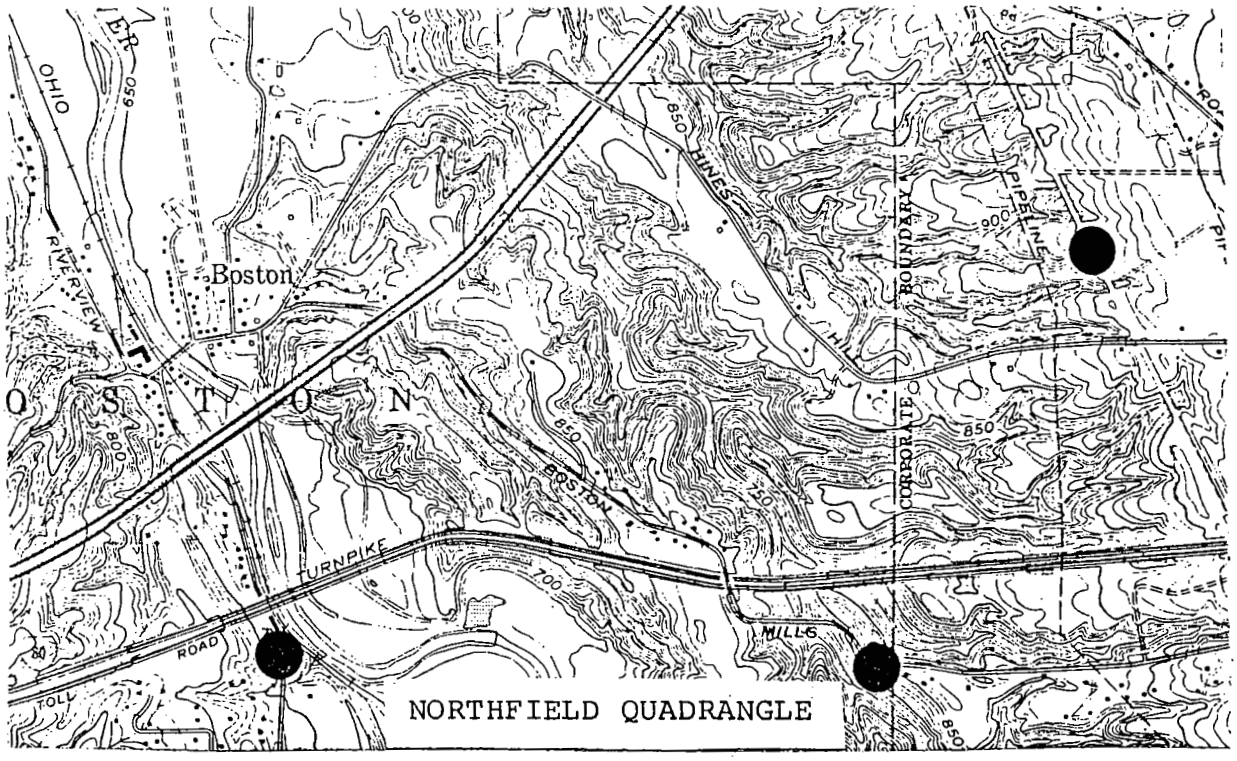


Fig. 48b. Sighting localities for Fox Squirrels.

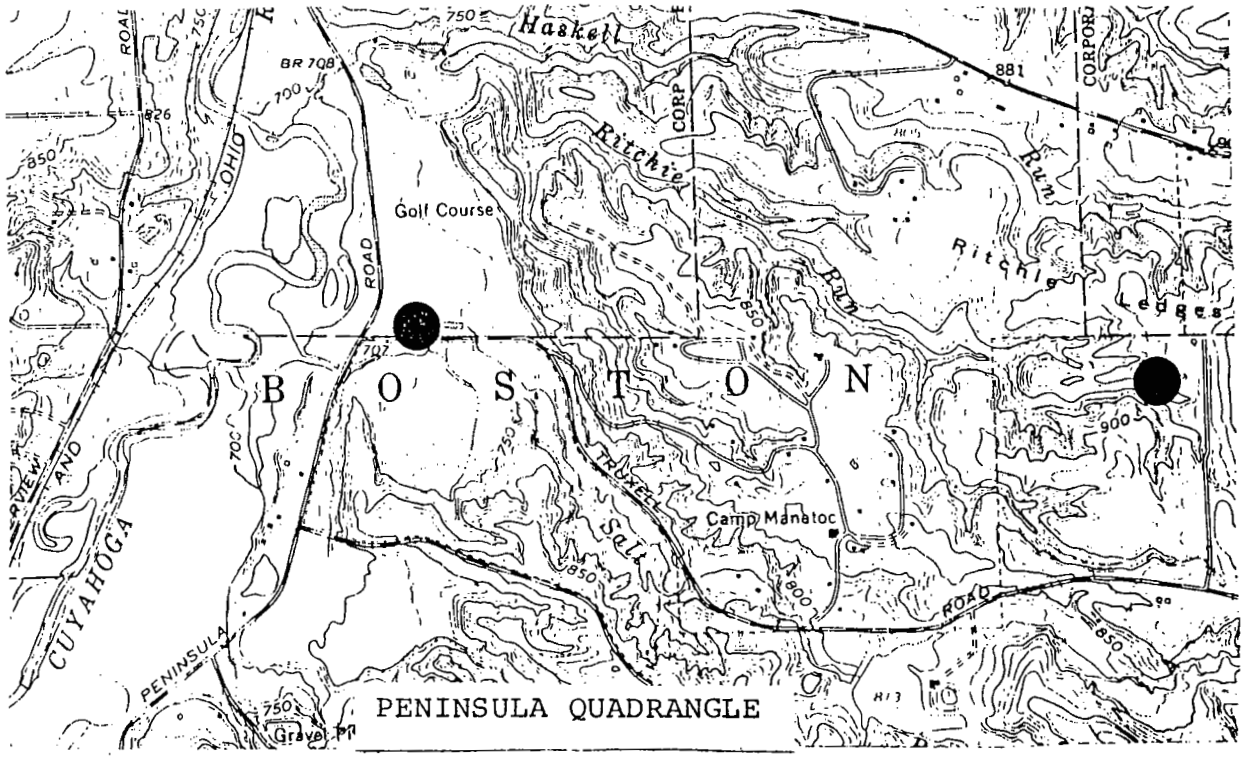


Fig. 49a. Sighting localities for Red Squirrels.

Red Squirrel or Chickaree, Tamiasciurus hudsonicus (Erxleben)

This squirrel is more common in conifer and mixed conifer-hardwood stand than in hardwoods alone. A cache hoarder, storing nuts and seeds in piles instead of at random, the Red Squirrel is probably not as important in the regeneration of nutbearing trees as are the Gray and Fox Squirrels.

LOCALITIES: Fig. 49b. Truxell Rd. beside golf course; the Octagon; Boston Mills Rd., trail to waterfall.

CURRENT STATUS: Infrequent.

Southern Flying Squirrel, Glaucomys volans (Linnaeus)

This small tree squirrel is almost totally nocturnal in its activities and is probably much more abundant in the CVNRA then our results indicate, for we did all of our observations during the day.

LOCALITIES: Fig. 50. Steep ravine above the trail to Stumpy Basin; Boston Hills Rd., found dead on trail to waterfall.

CURRENT STATUS: Probably less common than the other tree squirrels in the park but seldom observed due to their nocturnal habits.

FAMILY: Castoridae

Beaver, Castor canadensis (Kuhl)

The activities of this, our largest rodent, should be encouraged in the CVNRA where possible, for their dams create badly needed wetland habitat. At the present time beaver activity may be easily

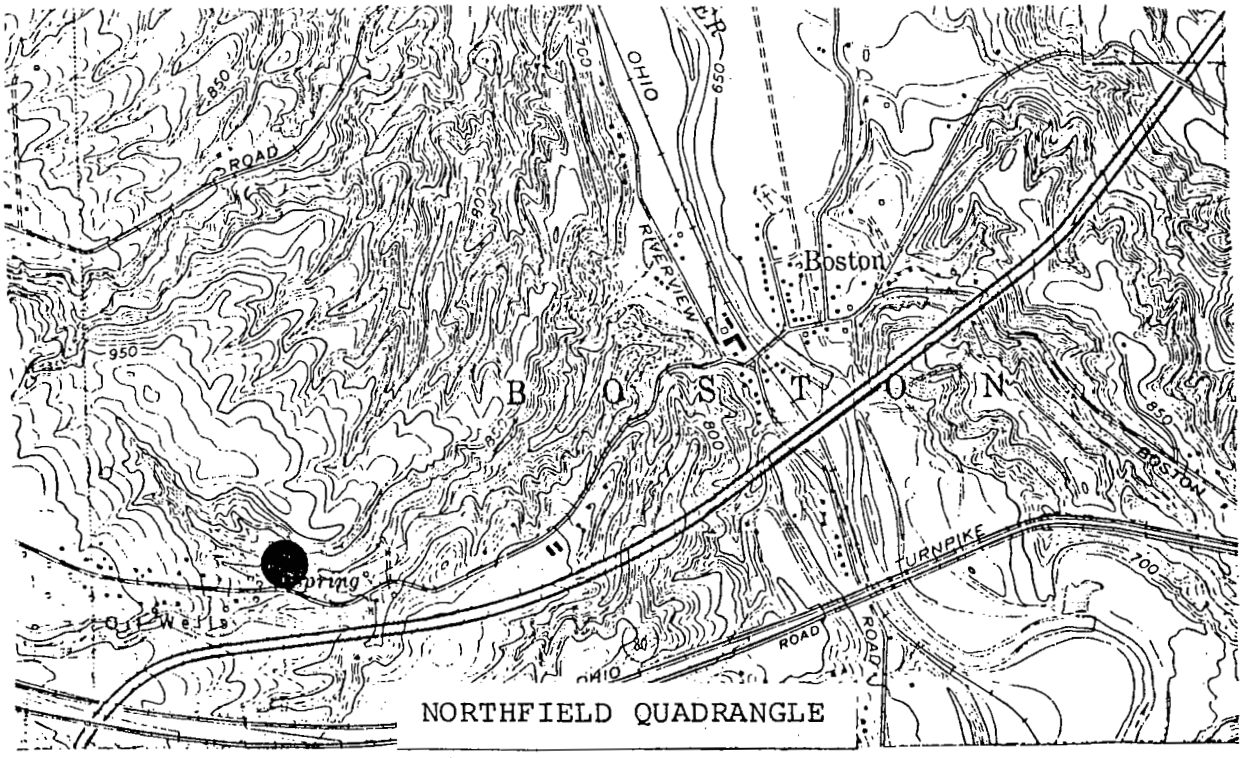


Fig. 49b. Sighting locality for the Red Squirrel.

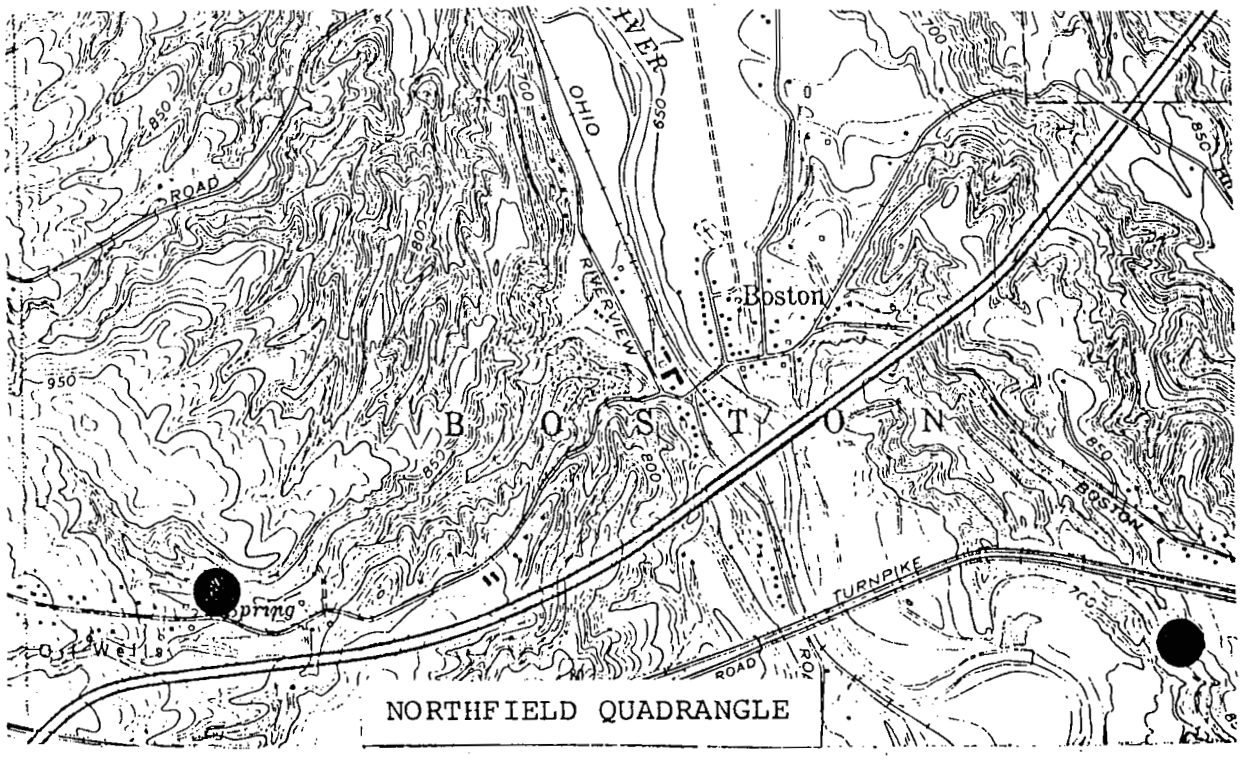


Fig. 50. Collecting sites for the Southern Flying Squirrel.

seen at the Oxbow Lake area north of the Ira Rd. bridge.

LOCALITIES: Fig. 51. Oxbow Lake; Cuyahoga River near Stumpy Basin.

CURRENT STATUS: Uncommon, but rapidly increasing.

FAMILY: Critcetidae

SUB-FAMILY: Cricetinae

White-footed Mouse, Peromyscus leucopus

The White-footed Mouse is the most common mouse we encountered during our small mammal survey at CVNRA. It was found, often in abundance, at every site we visited. The closely related Deer Mouse (Peromyscus maniculatus) was not seen during our studies and has not been recorded by earlier investigators.

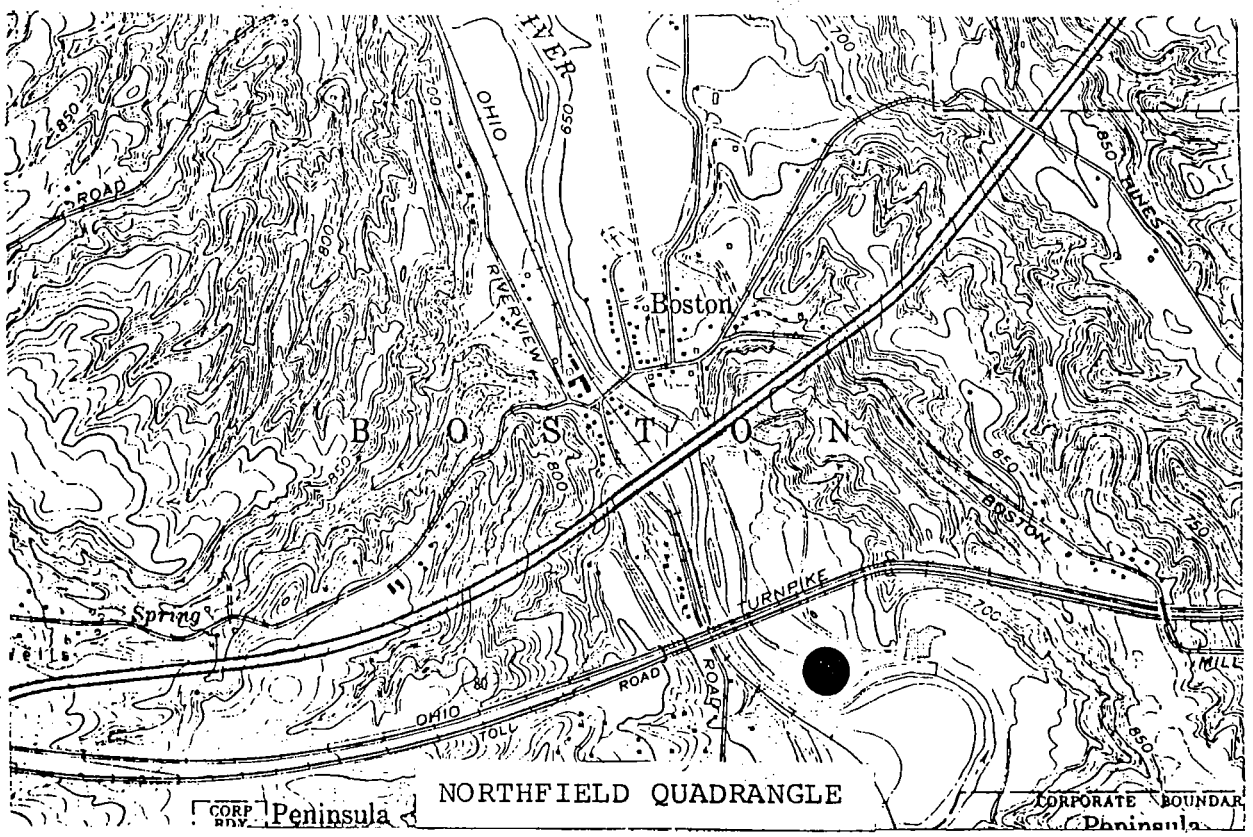
LOCALITIES: Figs. 52a, 52b, 52c. Kendall Park, Kendall Lake; Corner of Quick Rd. and Akron-Peninsula Rd.; the Octagon; Oxbow Lake; Riverview Rd. just north
of Valleyview Trailer Court; Major Rd. Pine Plantation west of Riverview Rd.; R.R. grade south of Highland Rd.; Stumpy asin near old canal bed; north side of Wheatley Rd. 0.5 mile east of Revere Rd.; south side of Columbia Rd. at start of downhill grade.

CURRENT STATUS: Common.

SUB-FAMILY: Microtinae

Meadow Vole (Field Mouse), Microtus pennsylvanicus (Ord)

This is the only vole we observed during our study. Although



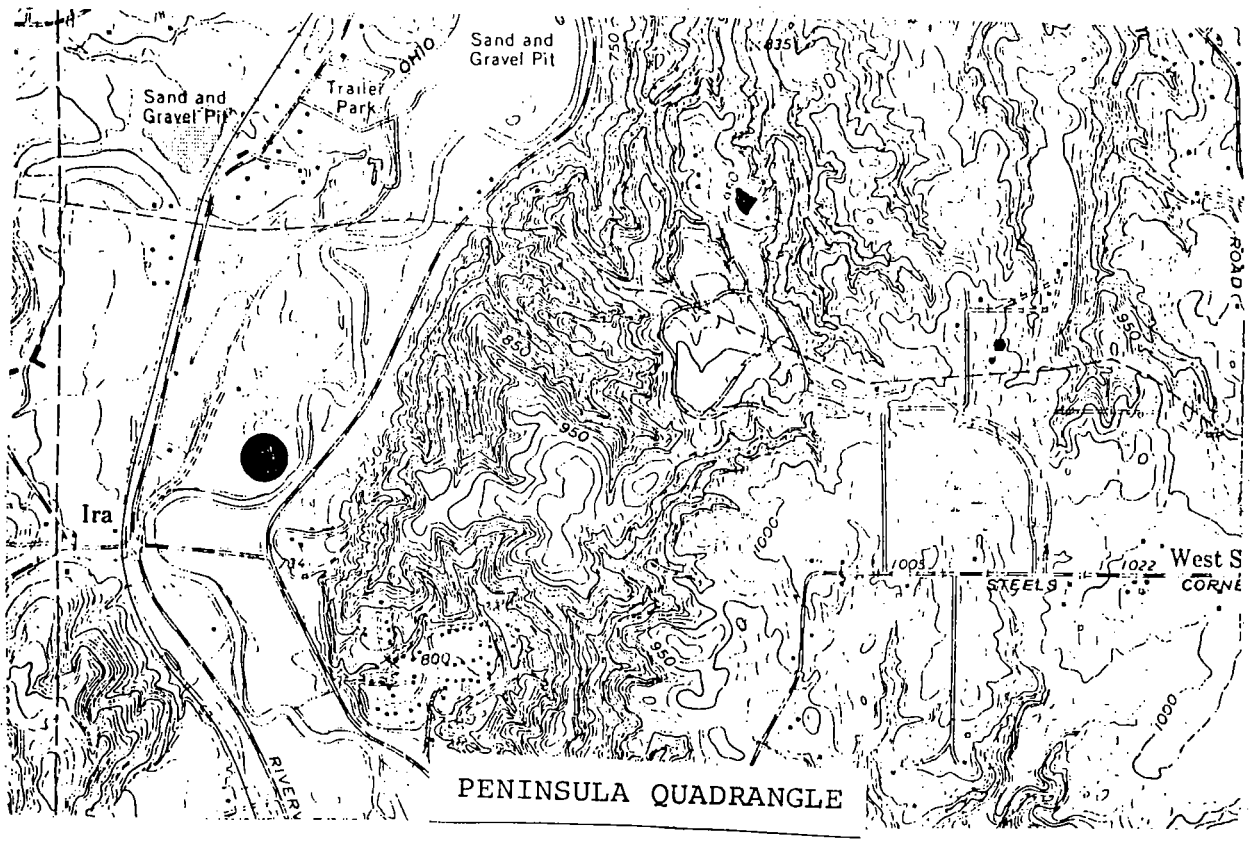


Fig. 51. Localities of Beaver populations.

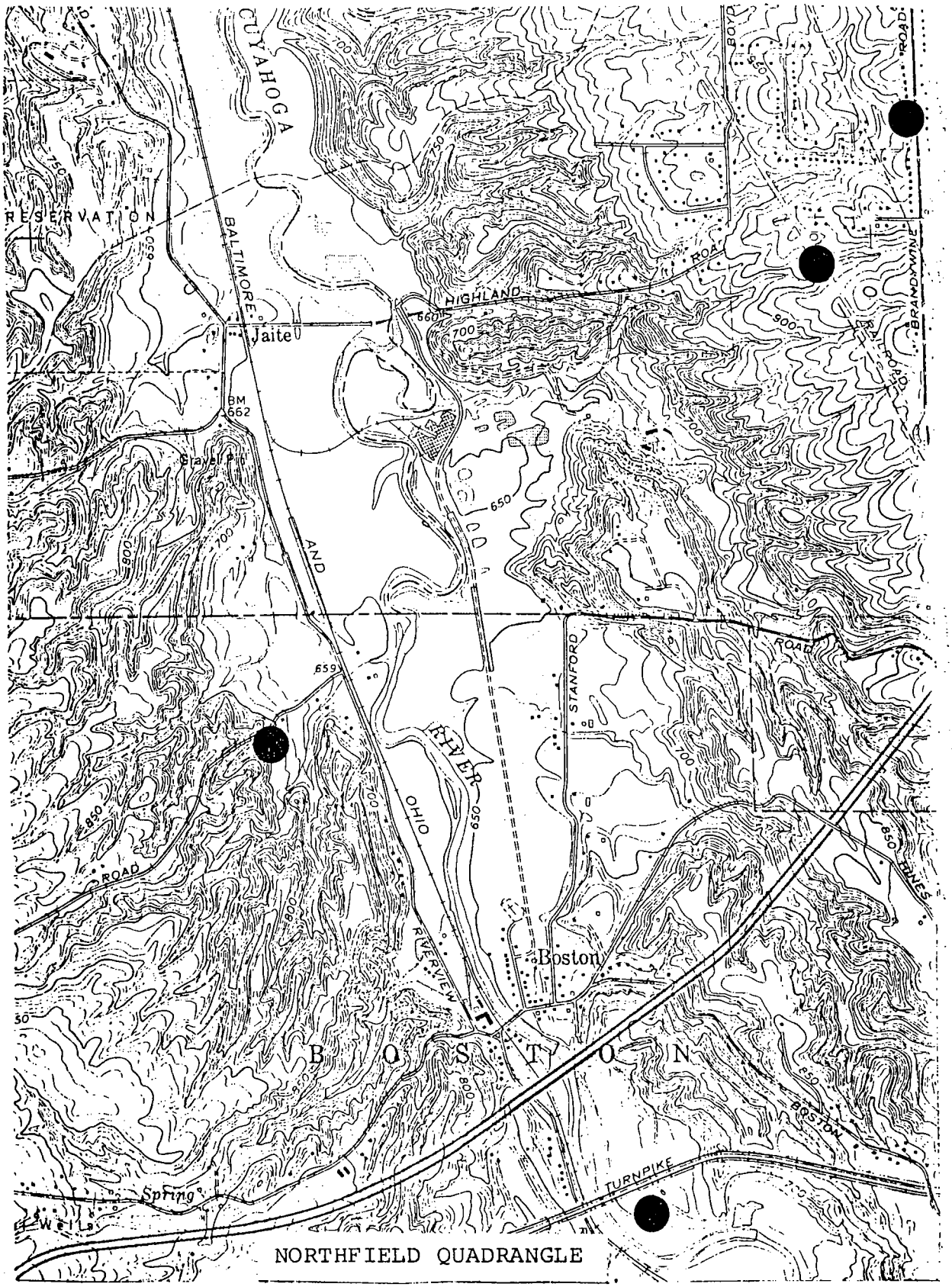


Fig. 52a. Collecting sites for the White-footed Mouse.

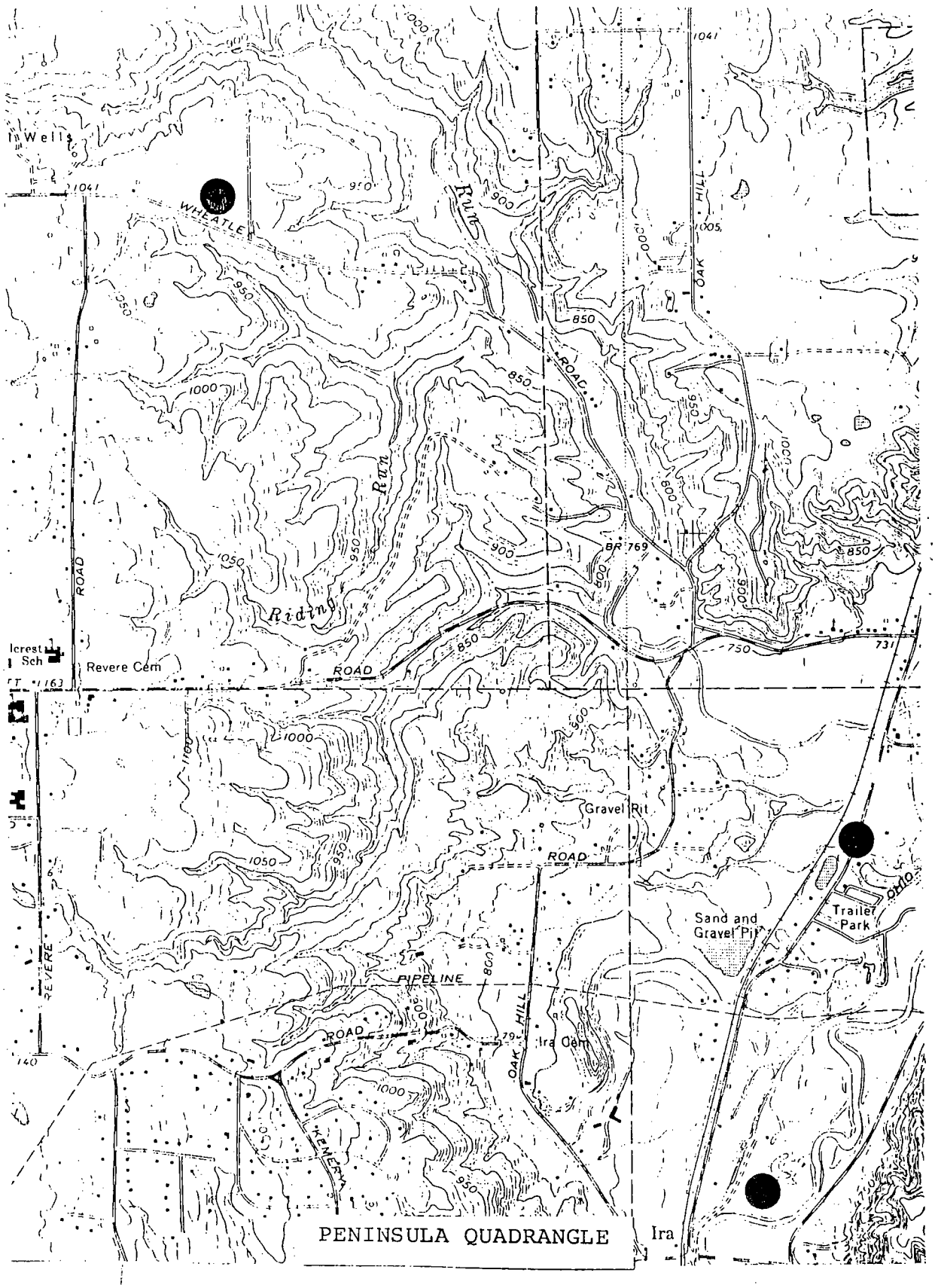


Fig. 52b. Collecting sites for the White-footed Mouse.

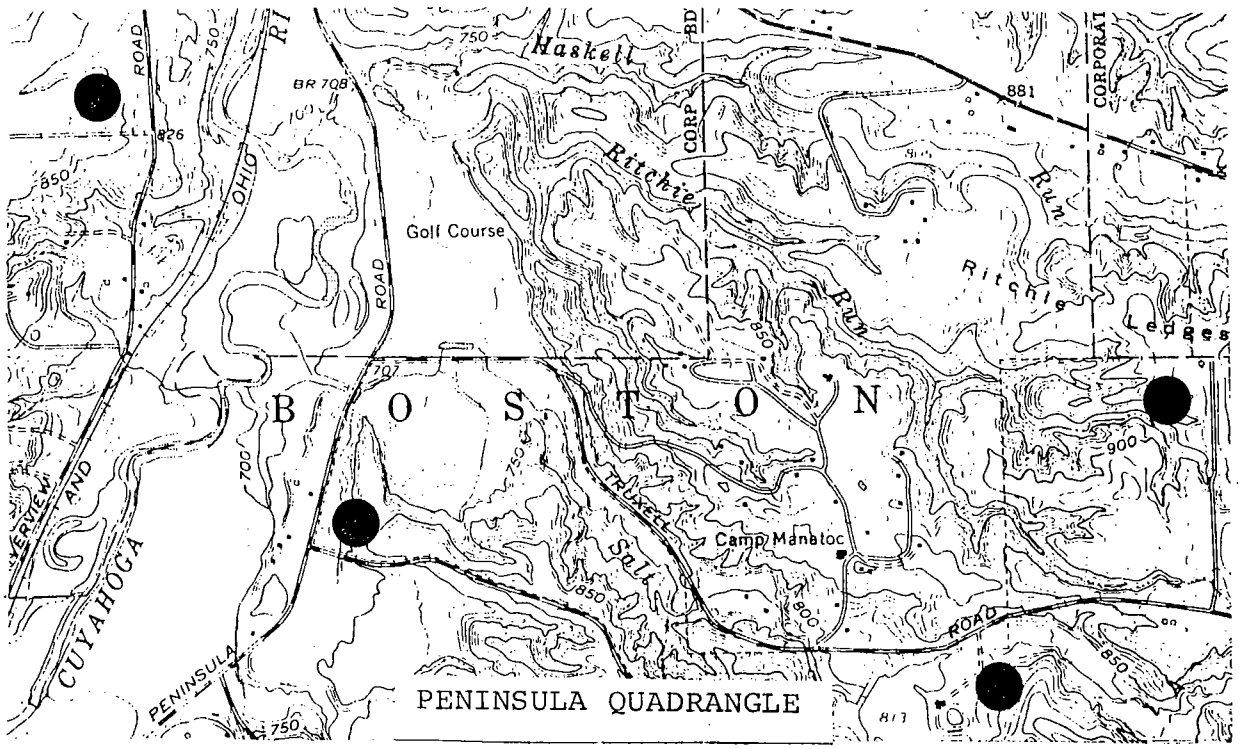


Fig. 52c. Collecting sites for the White-footed Mouse.

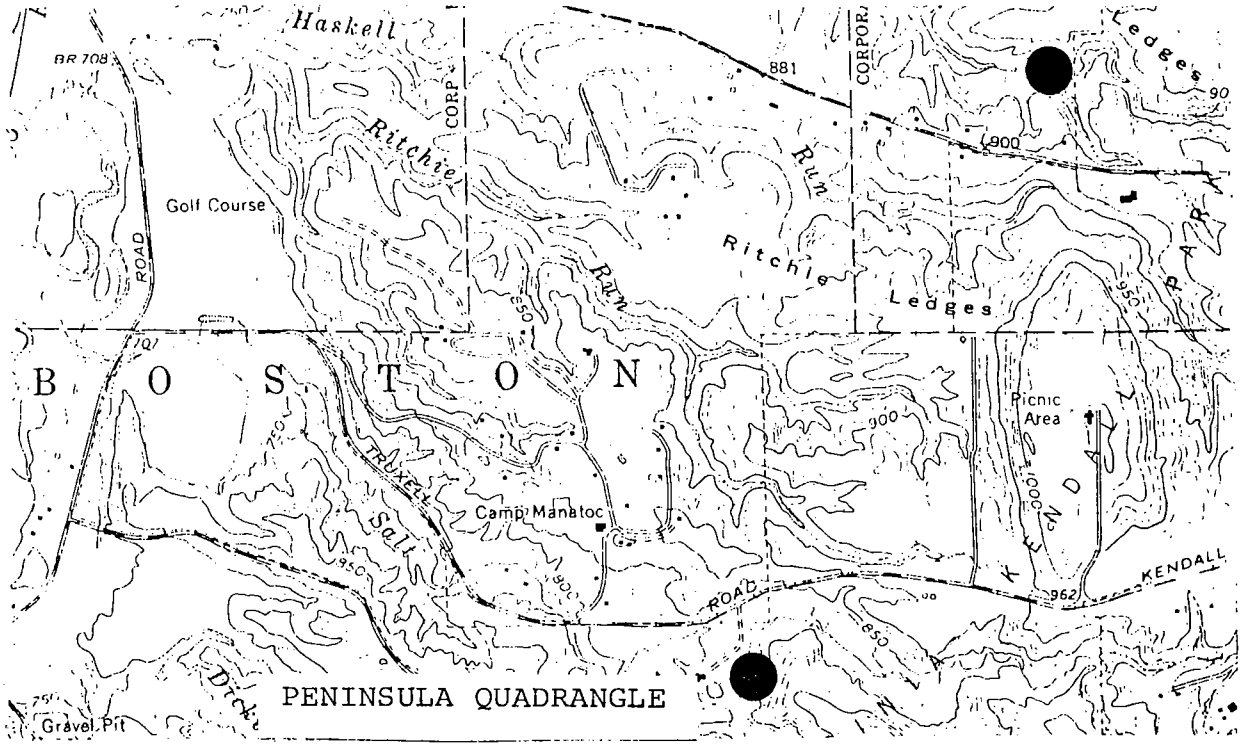


Fig. 53a. Collecting sites for Meadow Voles.

another species, the Pine Vole (Microtus pinetorum) should be in our area, we were unable to capture any for study. The Pine Vole is restricted to certain areas and tends to cyclic population levels; therefore future studies may indicate its presence at CVNRA as well. The Meadow Vole was common in all of the lowland meadow habitats we studied. Their characteristic tunnels crisscross beneath the grasses.
LOCALITIES: Figs. 53a, 53b, 53c. Kendall Lake-marsh near entrance; Oxbow Lake area; Major Rd. pine plantation; Boston Run at Happy Days; Stumpy Basin area grass field near Ohio Turnpike; Grass area between I-271 and Major Rd.
CURRENT STATUS: Common in grassy meadows, oldfield and grassy shrub seral communities.

Muskrat, Ondatra zibethicus (Linnaeus)

This important furbearer is confined to the few wetlands, ponds and riparian areas in the CVNRA. The largest numbers we observed were between Riverview Rd. and the Cuyahoga River north of the Ira Rd. bridge, where beaver activity has created a large marsh near Oxbow Lake. In these marsh habitats, muskrats build lodges of vegetation and mud, but in man-made ponds and along the Ohio Canal in the northern part of the park they are likely to tunnel into the banks resulting in collapse of the canal walls. Under these conditions it may be necessary to impose some form of control on their numbers.
LOCALITIES: Figs. 54a, 54b, 54c. Oxbow Lake; Kendall Lake; Stumpy Basin; Brandywine creek near Highland Rd.; Ohio Canal near west Valleyview Rd. Furnace Run between Riverview Rd. and Cuyahoga River.

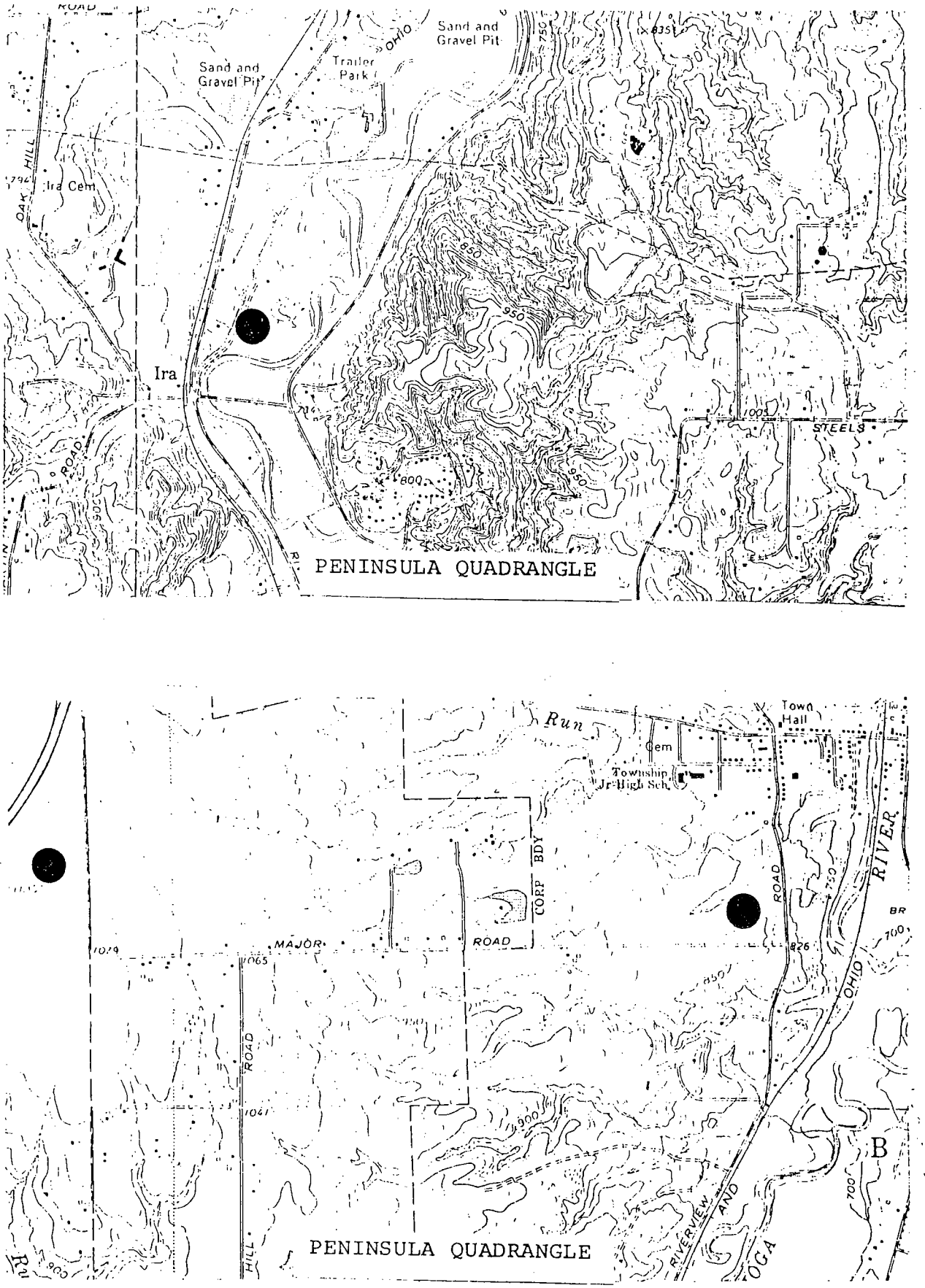


Fig. 53b. Collecting sites for Meadow Voles.

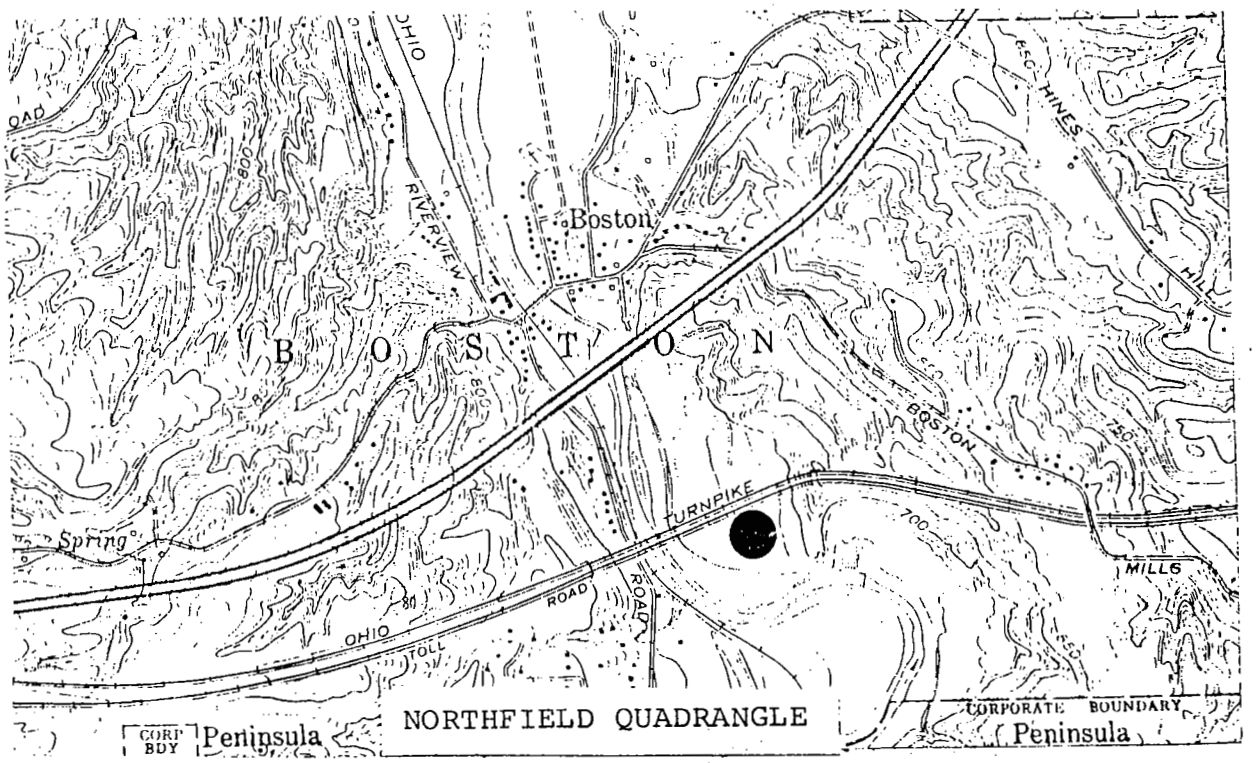


Fig. 53c. Collecting site for Meadow Voles.

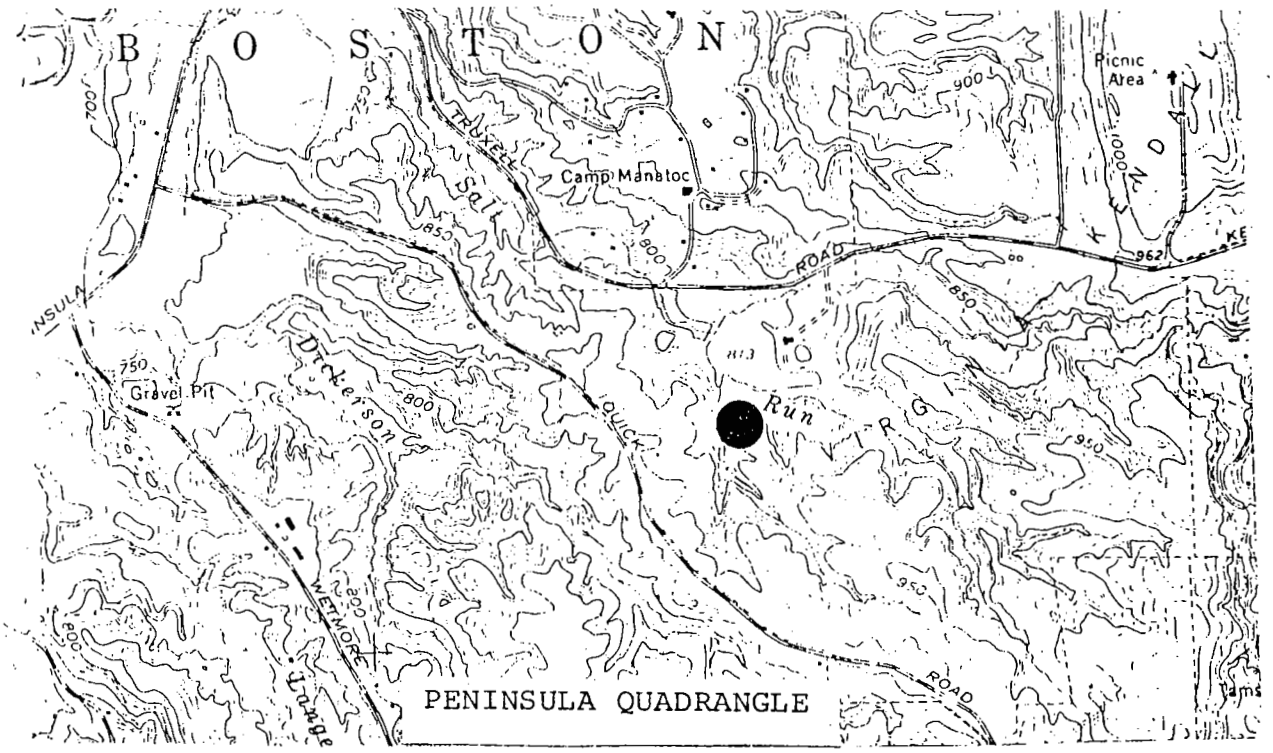


Fig. 54a. Sighting locality for Muskrats.

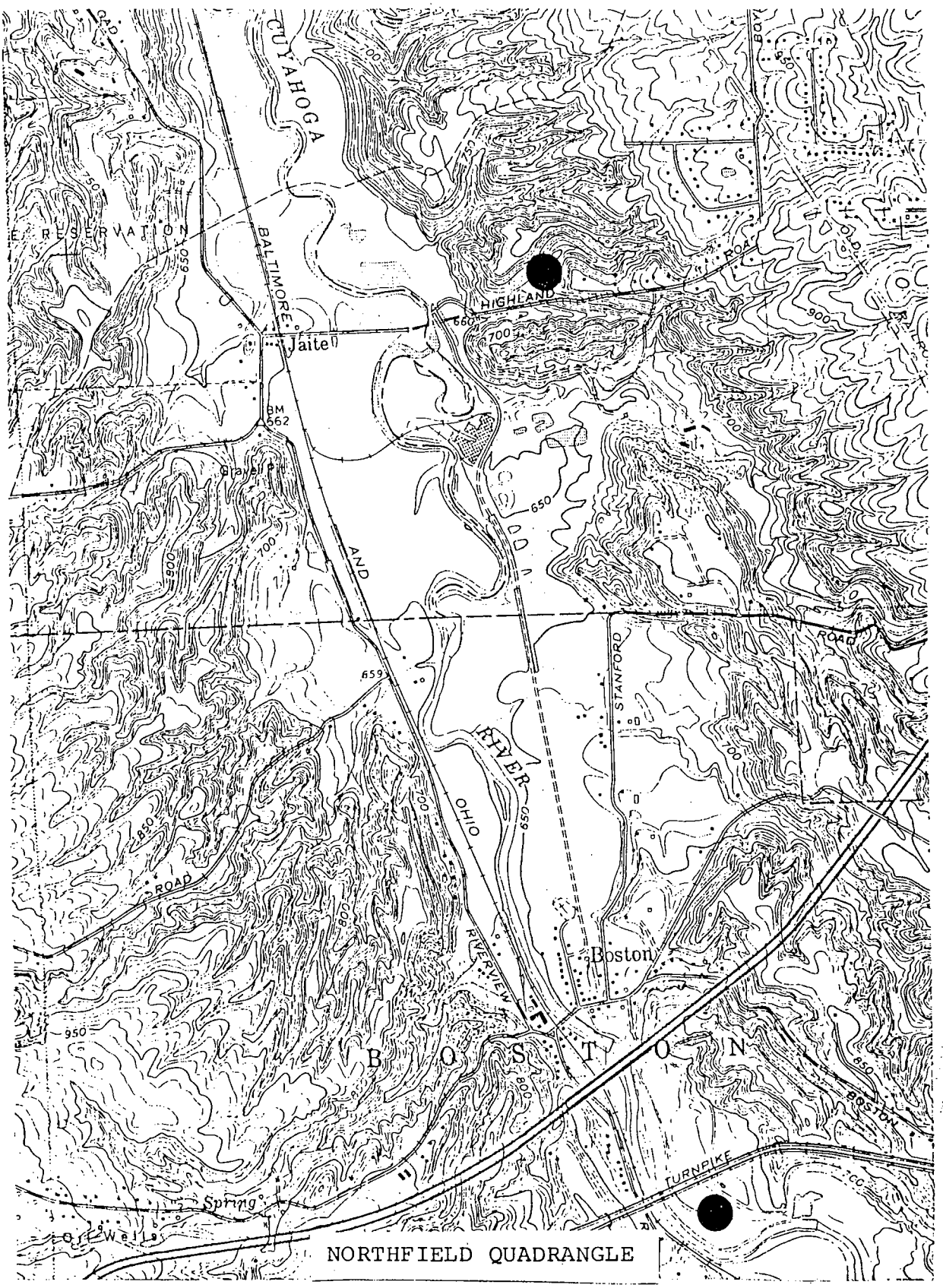


Fig. 54b. Sighting locality for Muskrats.

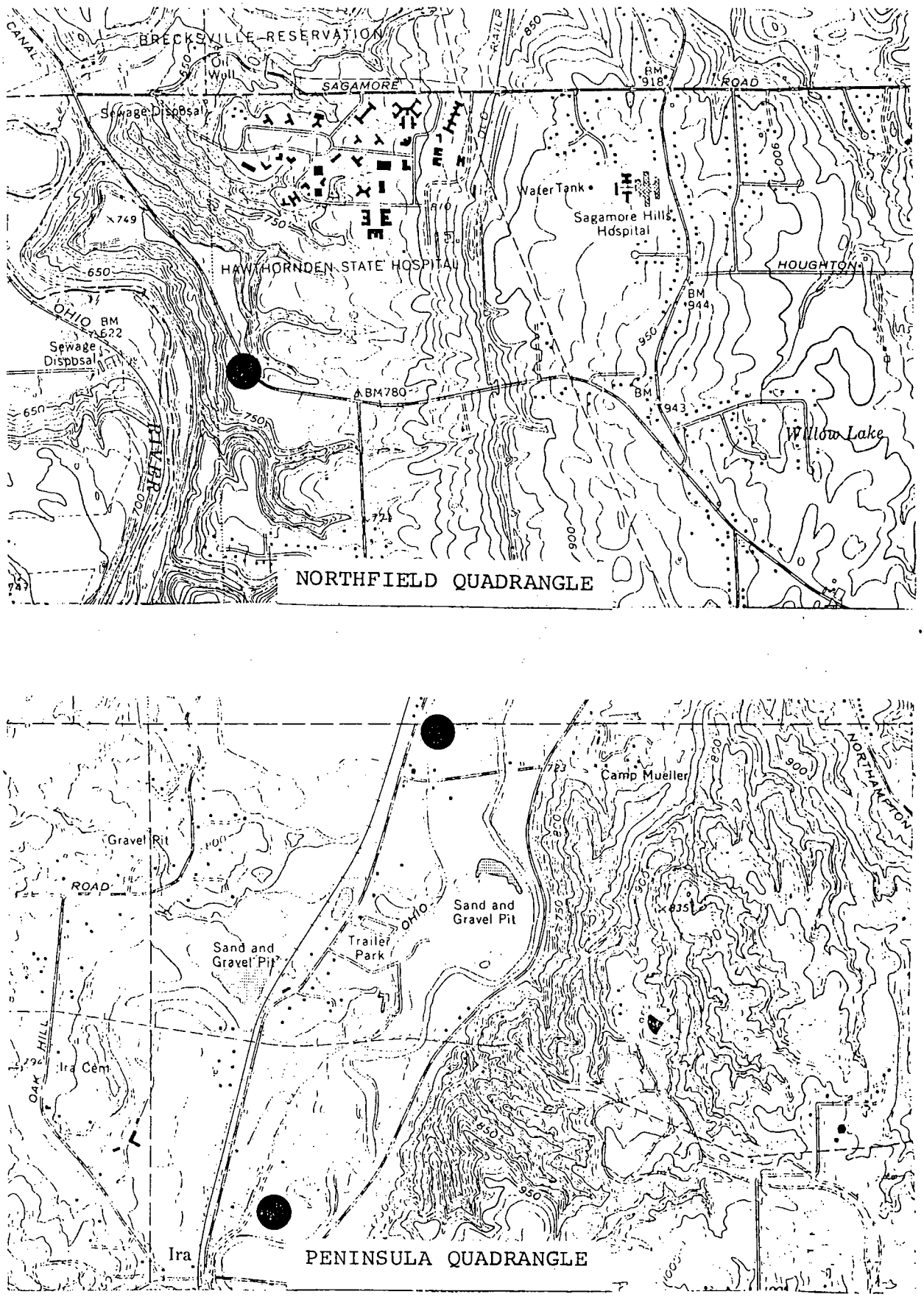


Fig. 54c. Sighting localities for Muskrats.

CURRENT STATUS: Common.

FAMILY: Muridae

Norway Rat, (Common or Brown Rat)

This old world rat appears to be rather rare in the CVNRA. Our only capture being made under the R.R. bridge over Furnace Run near Everett. However they are probably in and near the small towns and farmyards scattered through the park.

LOCALITIES: Fig. 55. R.R. bridge over Furnace Run south of Everett.

CURRENT STATUS: Probably common near areas of human habitation, rare elsewhere in the park.

House Mouse, Mus musculus (Linnaeus)

Like the Norway Rat, the House Mouse seems to be much more common near areas of human habitation. Only two specimens were taken in our study from natural areas.

LOCALITIES: Fig. 56. Near Cuyahoga River between the I-271 and Ohio Turnpike bridges; southwest side of Boston Mills Rd. between I-271 and Ohio Turnpike-along creek

CURRENT STATUS: Probably rare in the CVNRA except near areas of human habitation.

FAMILY: Zapodidae

Meadow Jumping Mouse, Zapus hudsonius (Zimmerman)

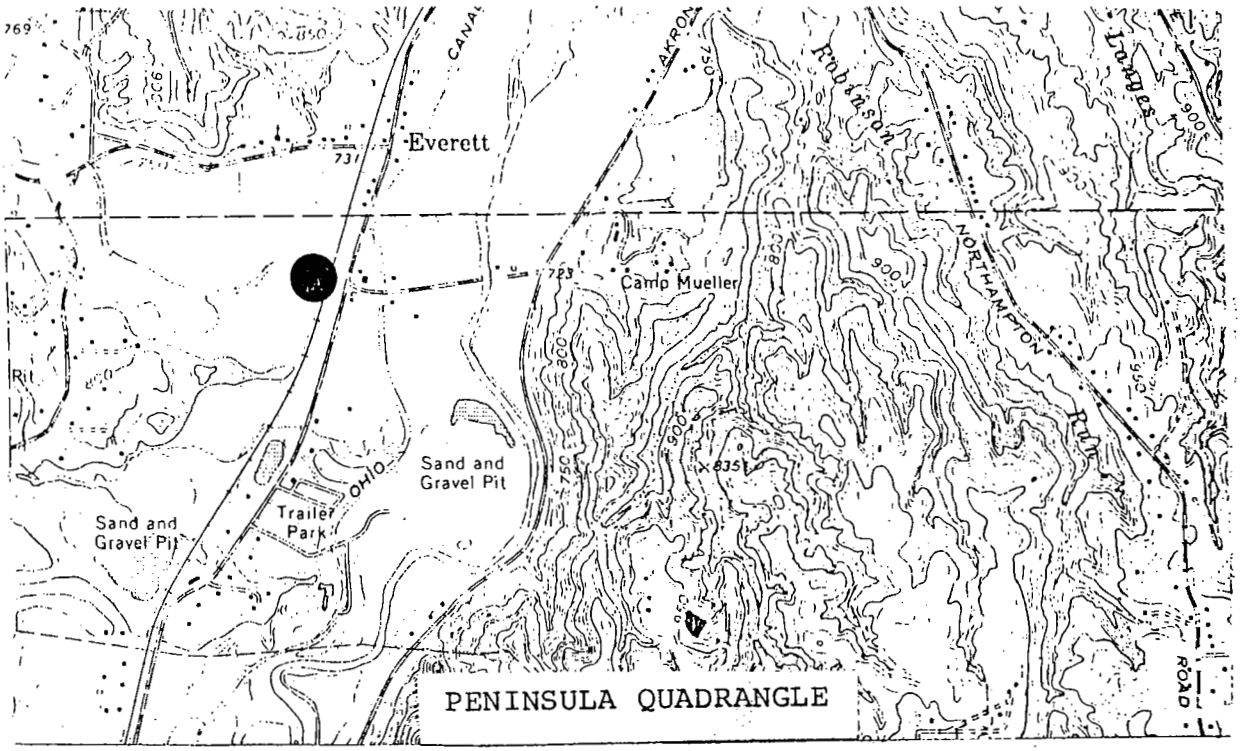


Fig. 55. Sighting locality for the Norway Rat.

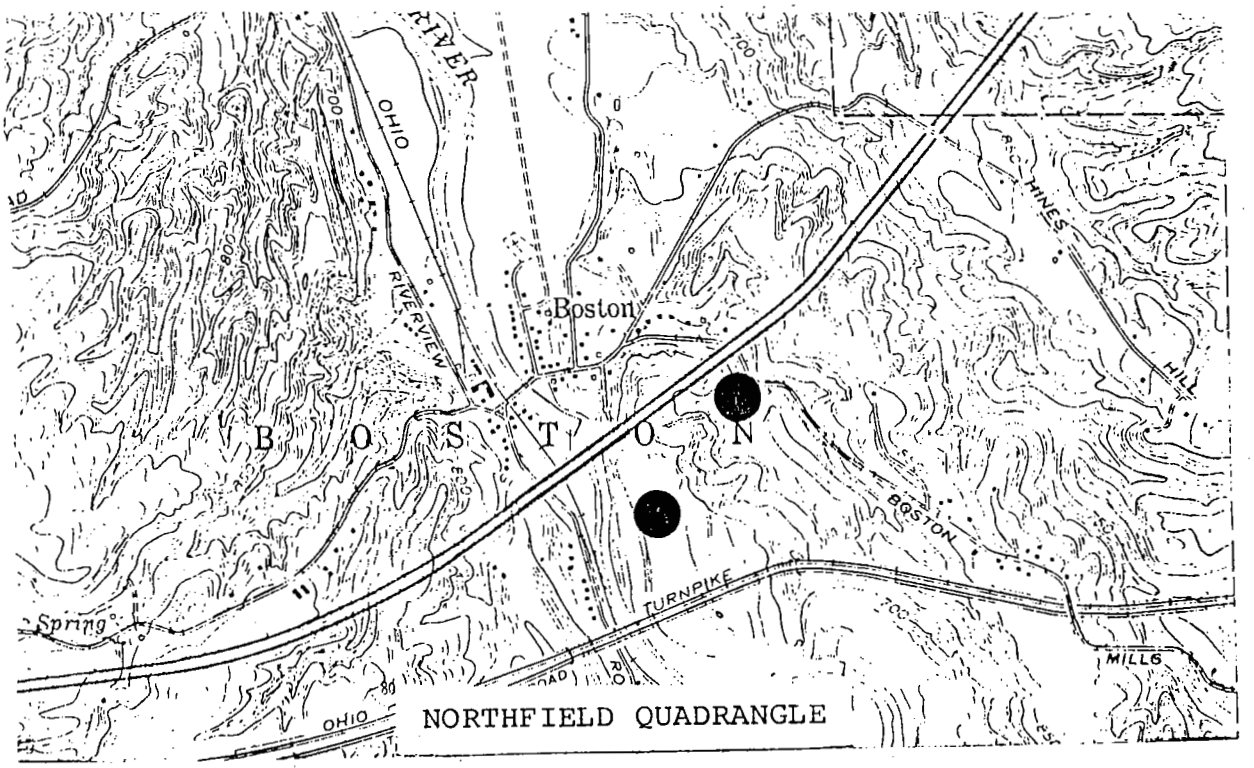


Fig. 56. Collection sites for the House Mouse.

We were unable to find this species during our study, but it has been reported previously by Jack McCormick & Associates, Inc. Certainly numerous habitats along the streams and along the banks of the Cuyahoga River supply ample habitat for this species.

ORDER: Carnivora

FAMILY: Canidae

Red Fox, Vulpes vulpes (Linnaeus)

The Red Fox is rather common in the CVNRA, especially along the more open, brushy fields near the old farms or where farming continues. We saw only two but saw many tracks in the snow made by this species.

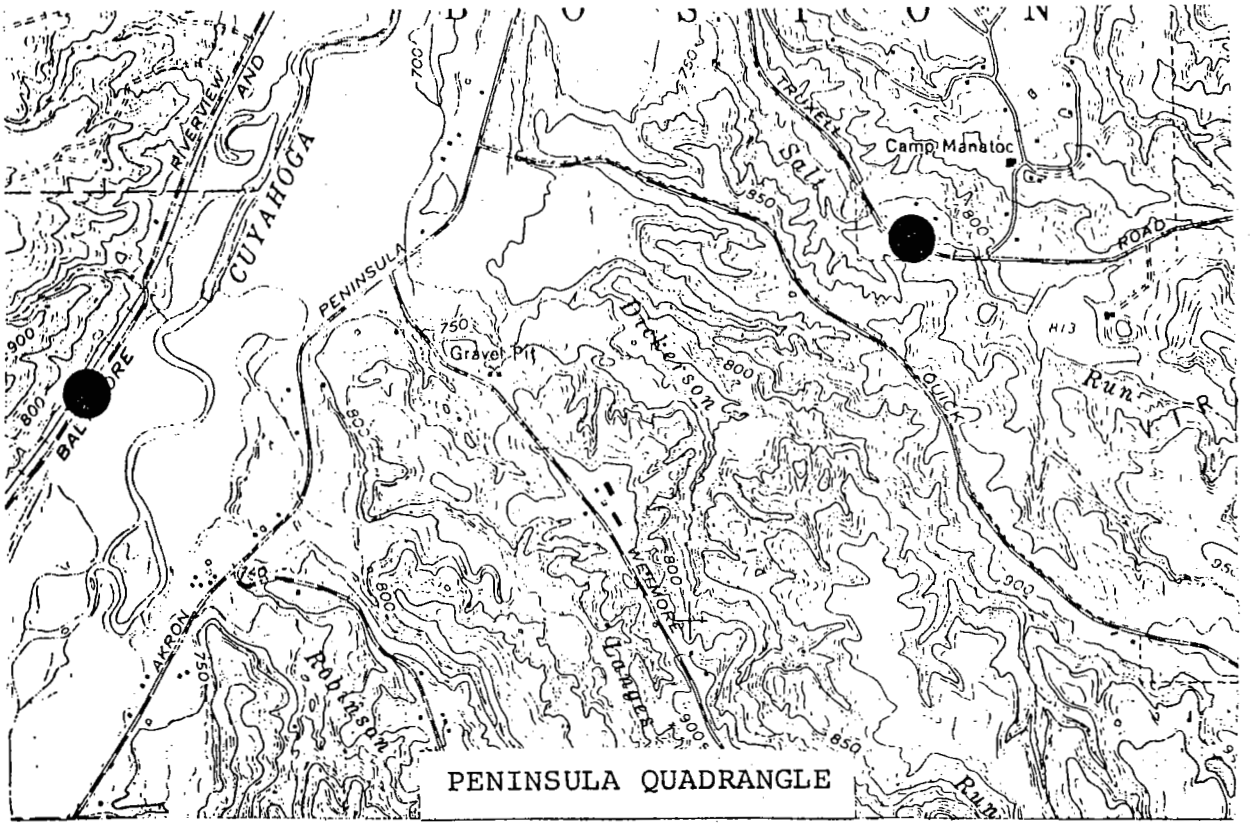
LOCALITIES: Fig. 57. Riverview Rd., 1 mile north of Everett (roadkill); Truxell Rd. near Camp Manatoc; south side of Sanitation Rd. west of Brecksville Sewage Plant-1 adult, 5 young; southwest side of Truxell Rd.; north of 4390 Black Rd.; Revere Rd.; Tract 103-53 Hrabak property; Tract 103-47 Sanitation Rd. at Evert Barn; Tract 103-76 Sanitation Rd.

CURRENT STATUS: Common

Gray Fox, Urocyon cinereoargenteus (Schreber)

More of a woodland species than the Red Fox, the Gray Fox is to be looked for in heavier cover.

LOCALITIES: Fig. 58a, 58b. Kendall Park picnic area near the Ledges; Wheatley Rd. near Furnace Run; Akron-Peninsula Rd. south of



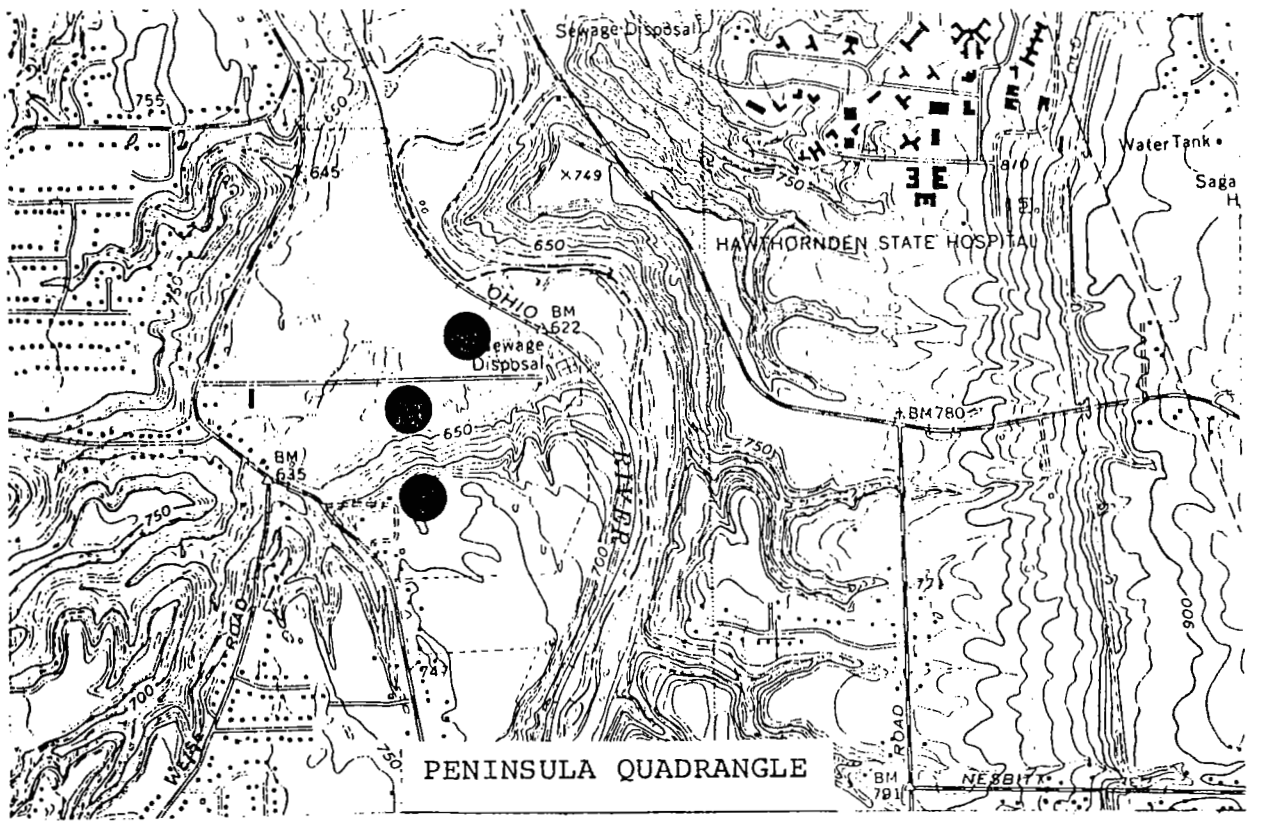


Fig. 57. Sighting localities for the Red Fox.

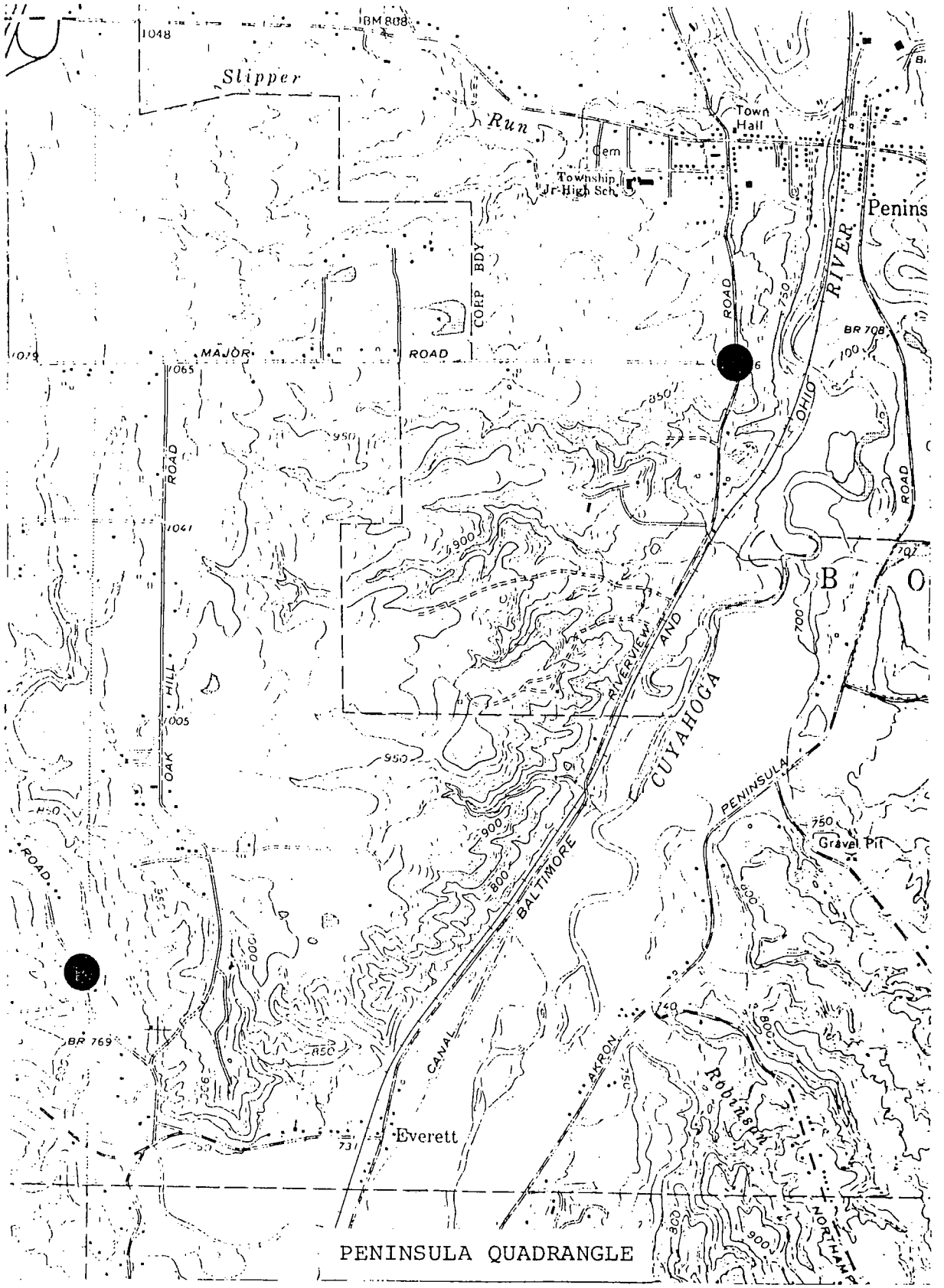


Fig. 58a. Sighting localities for the Gray Fox.

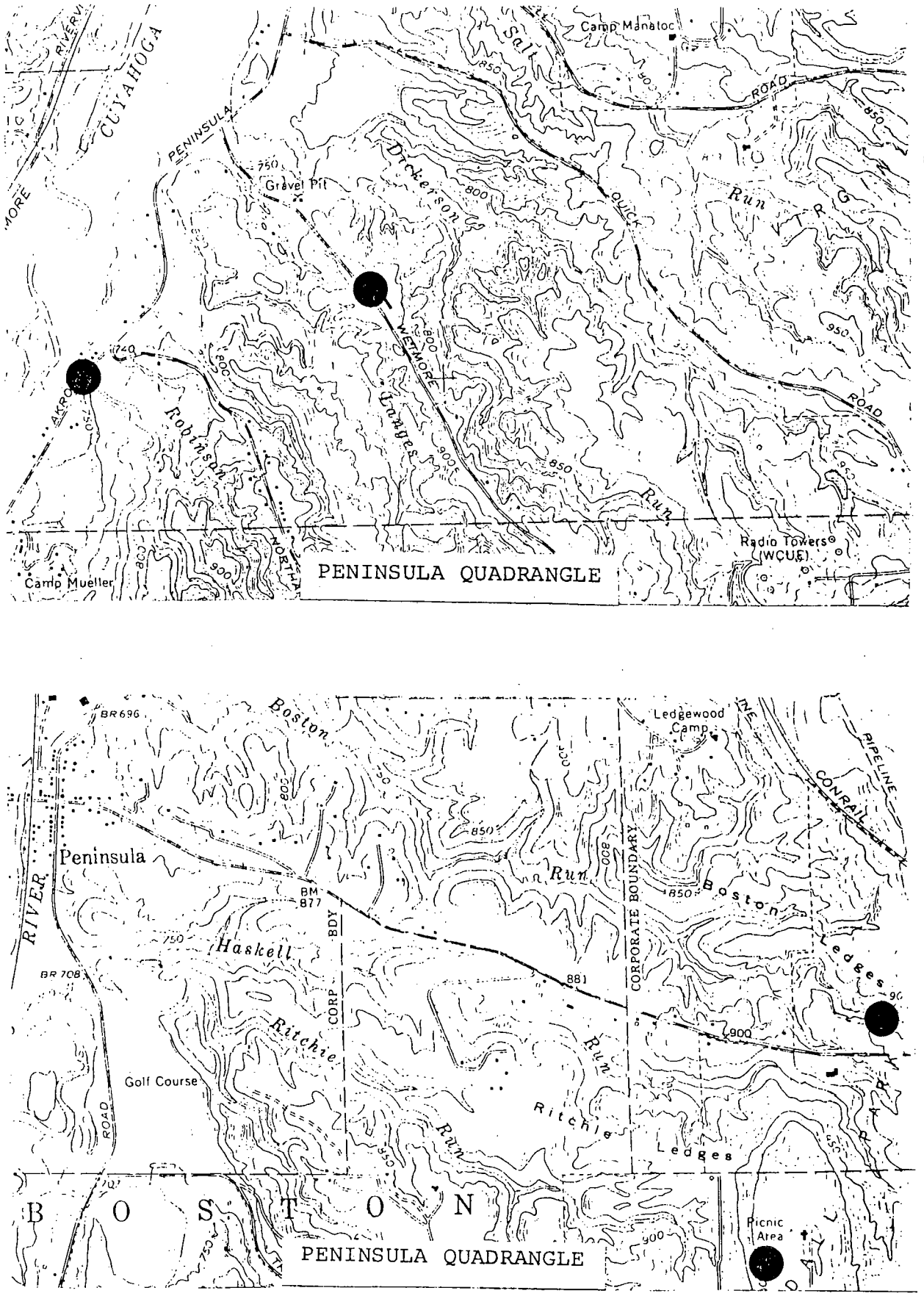


Fig. 58b. Sighting localities for the Gray Fox.

Northampton Rd.; Wetmore Rd.; north of 303 east of Happy Days lot; Major Rd. at junction with Riverview Rd. (roadkill).

CURRENT STATUS: Infrequent, seems to be increasing.

FAMILY: Procyonidae

Raccoon, Procyon lotor (Linnaeus)

The raccoon population in the CVNRA is increasing to the point where in some of the picnic areas they may eventually make pests of themselves. Their tracks are, literally along every stream in the park.

LOCALITIES: Figs. 59a, 59b, 59c. Valleyview Rd. near the Ohio Canal; Highland Rd. along Brandywine Creek; along the Cuyahoga River between I-271 and the Ohio Turnpike; Furnace Run at Wheatley Rd.; Oxbow Lake area; Kendall Park, Kendall Lake; stream below Happy Days parking lot; Hines Hill Rd.; 0.25 mile south of R.R. on Riverview Rd.; 0.5 mile west of Happy Days on 303 (roadkill); Stumpy Basin.

CURRENT STATUS: Common.

FAMILY: Mustelidae

Least Weasel, Mustela nivalis (Linnaeus)

Our observations would indicate that neither the Least Weasel nor the Long-tailed Weasel are very common in the CVNRA.

LOCALITIES: Fig. 60. Off Boston Mills Rd. on path leading to Stumpy Basin from the red barn-dead along path; Major Rd. near Deep Lock

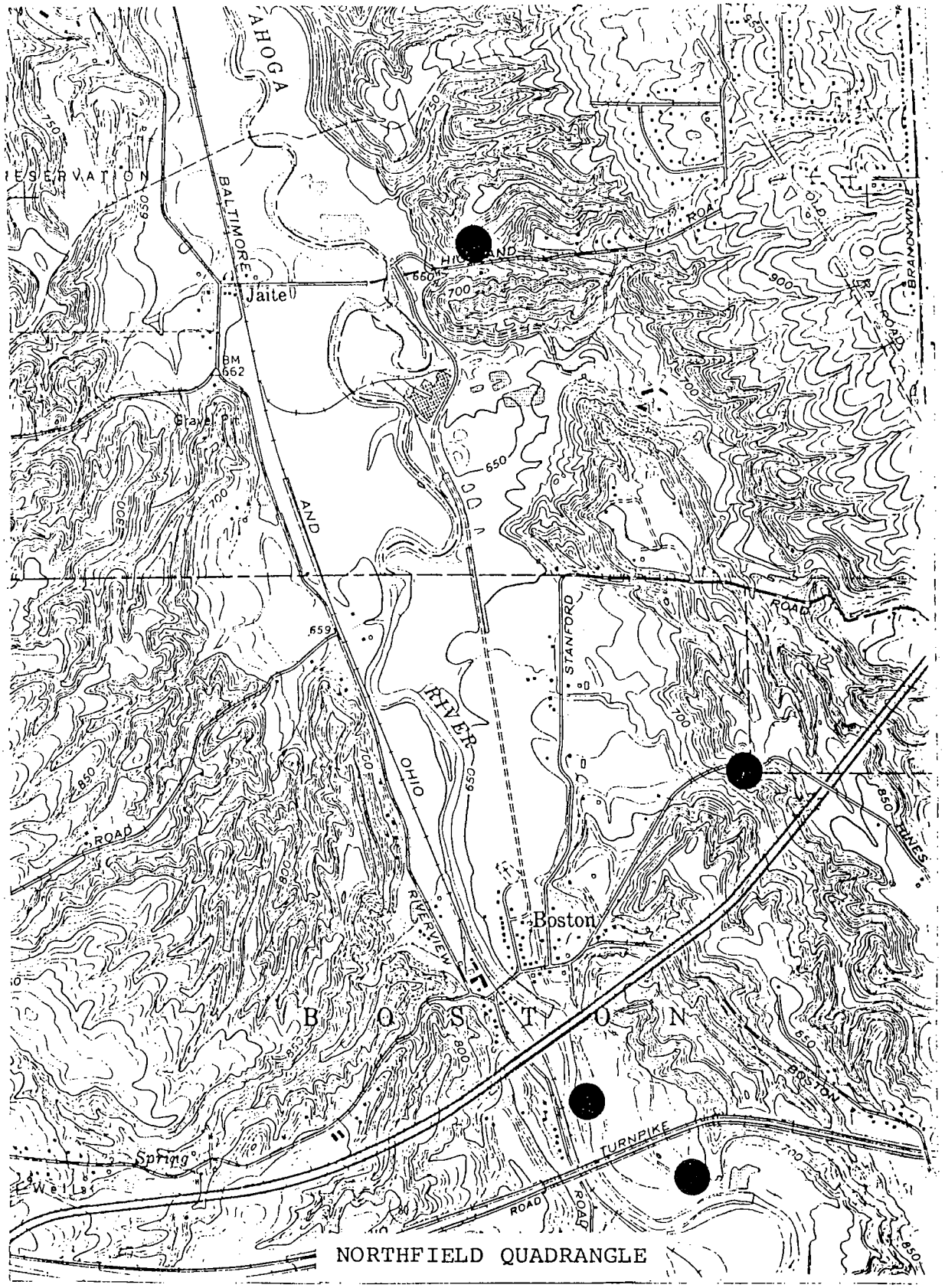


Fig. 59a. Sighting localities for the Raccoon.

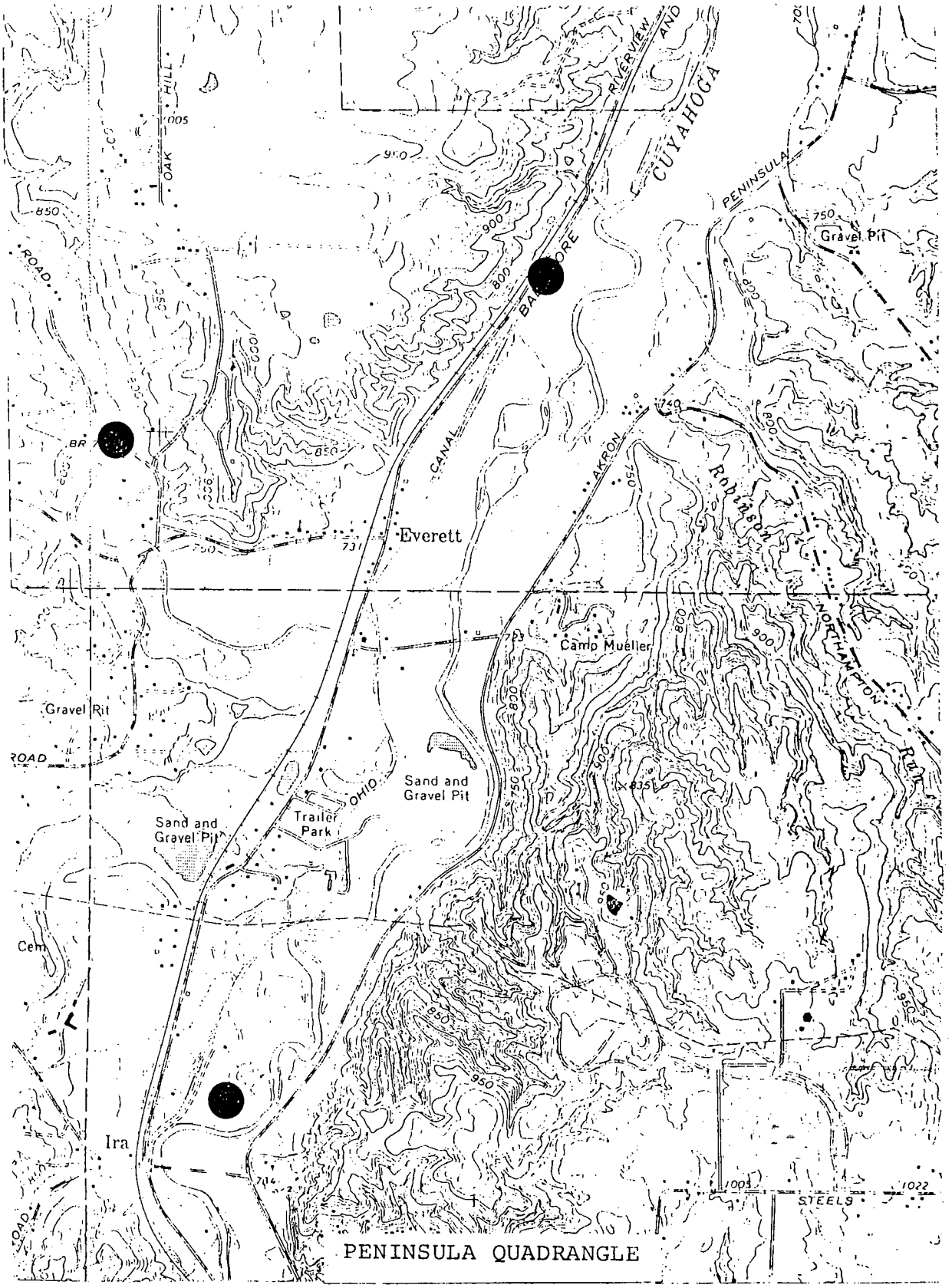
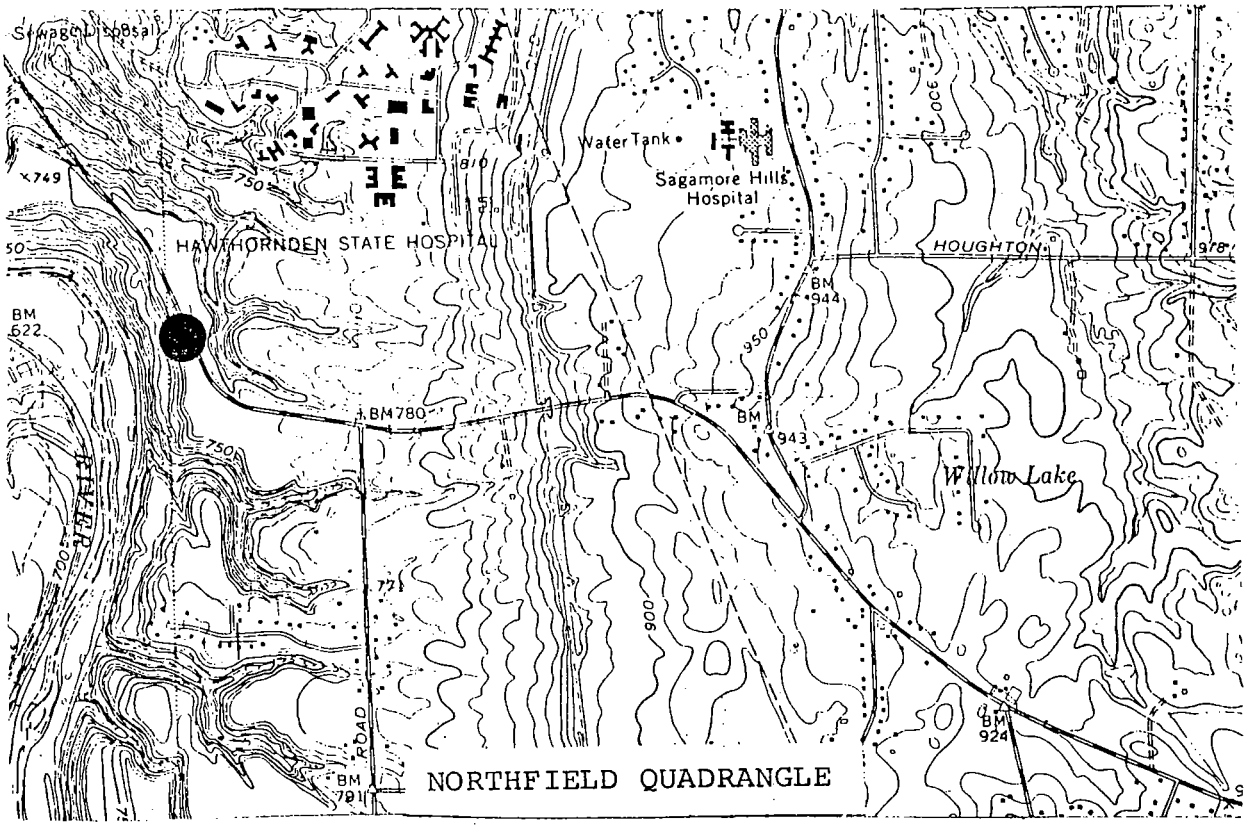


Fig. 59b. Sighting localities for the Raccoon.



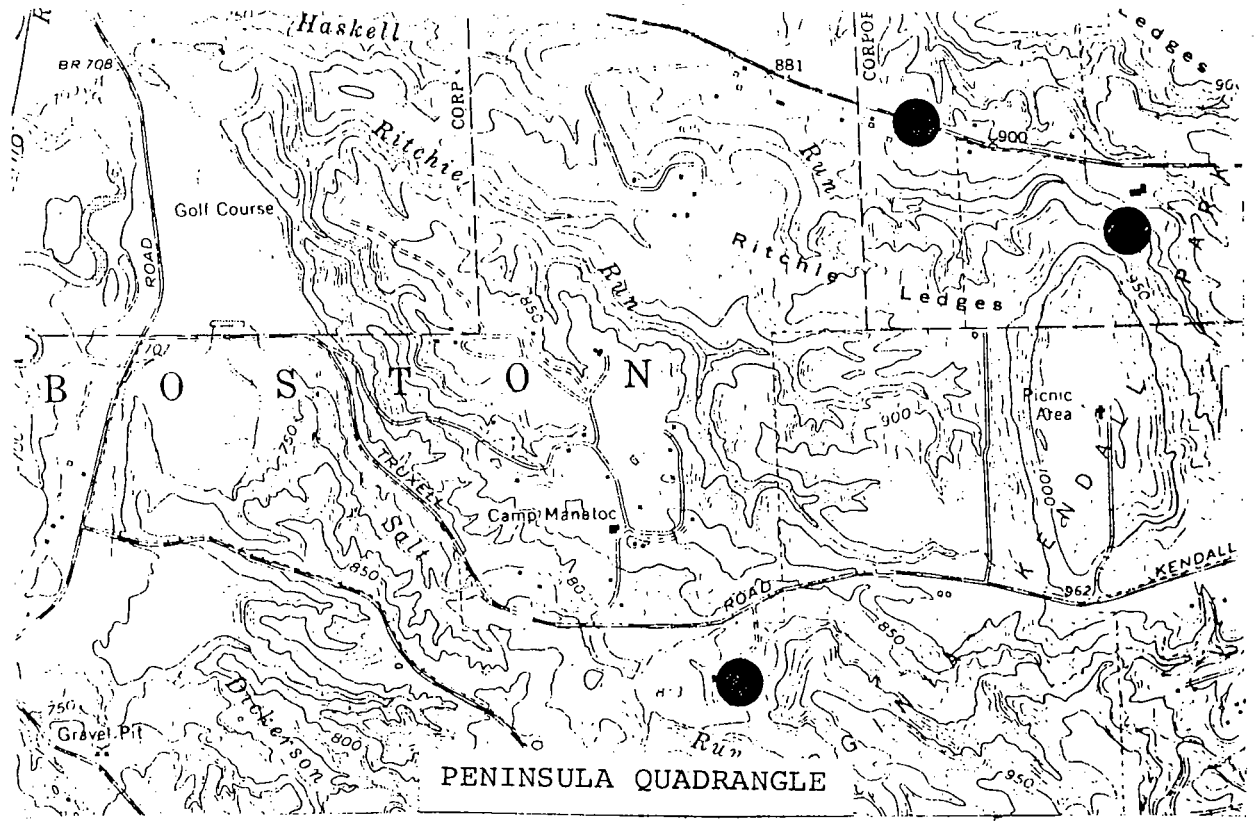


Fig. 59c. Sighting localities for the Raccoon.

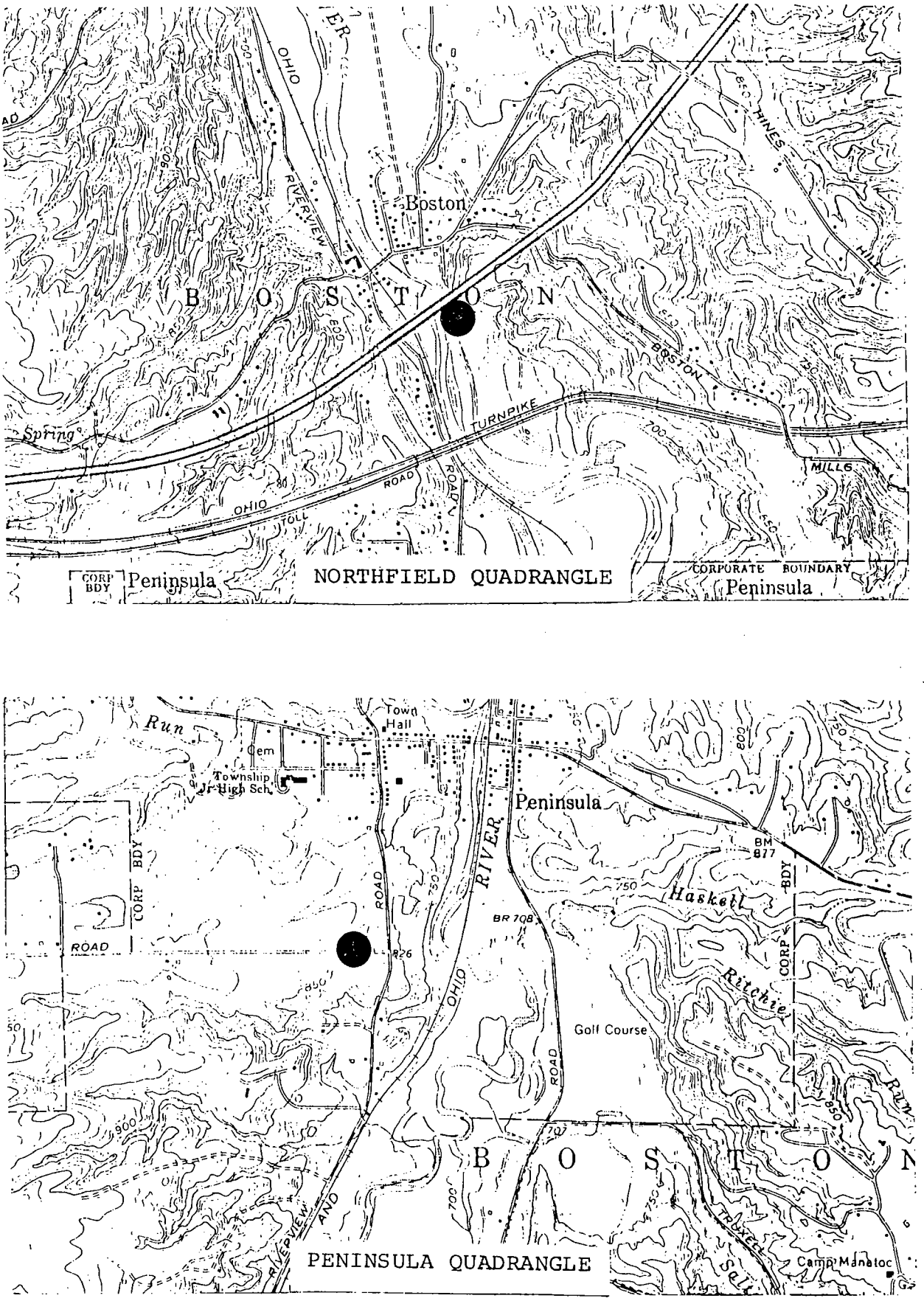


Fig. 60. Sighting localities for the Least Weasel.

Quarry.

CURRENT STATUS: Rare.

Long-tailed Weasel, Mustela frenata (Lichtenstein)

We obtained only one specimen of this species near Oxbow Lake north of the Ira Rd. bridge.

LOCALITIES: Fig. 61. Along the Cuyahoga River, near Oxbow Lake, north of Ira Rd.

CURRENT STATUS: Rare.

Mink, Mustela vison (Schreber)

The mink was considerably more common than the weasels and because of their riparian habits, more easily tracked.

LOCALITIES: Figs. 62a, 62b. Furnace Run near Wheatley Rd.; Stumpy Basin along the Cuyahoga River; 1 mile west of old Route 8 on Boston Mills Rd. (roadkill).

CURRENT STATUS: Infrequent.

Striped Skunk, Mephitis mephitis (Schreber)

The skunk is the most common mustelid in the Park, but because of their nocturnal habits are not often seen. We found evidence of their scavenging after dark in the picnic areas, in company with raccoon.

LOCALITIES: Fig. 63. Ritchie Ledges; Kendall Lake; Stumpy Basin; Route 303 0.25 mile west of Pine Lane (roadkill).

CURRENT STATUS: Frequent.

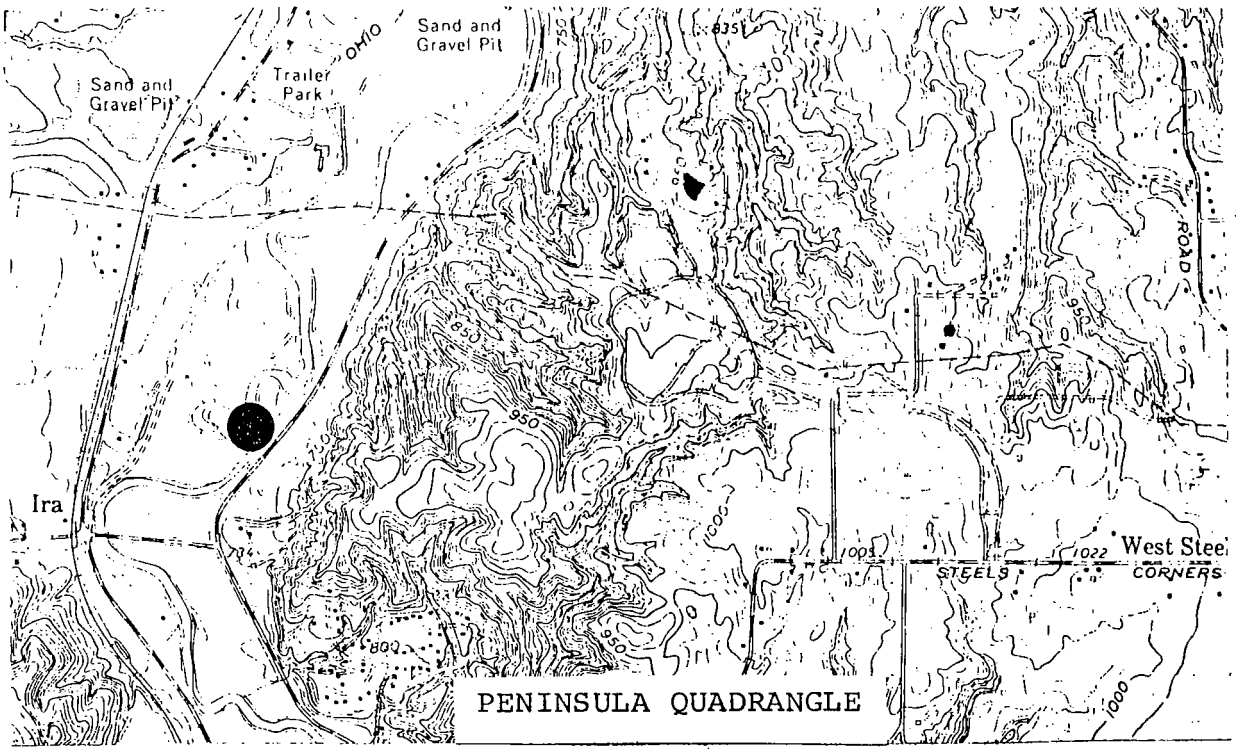


Fig. 61. Collection site for the Long-tailed Weasel.

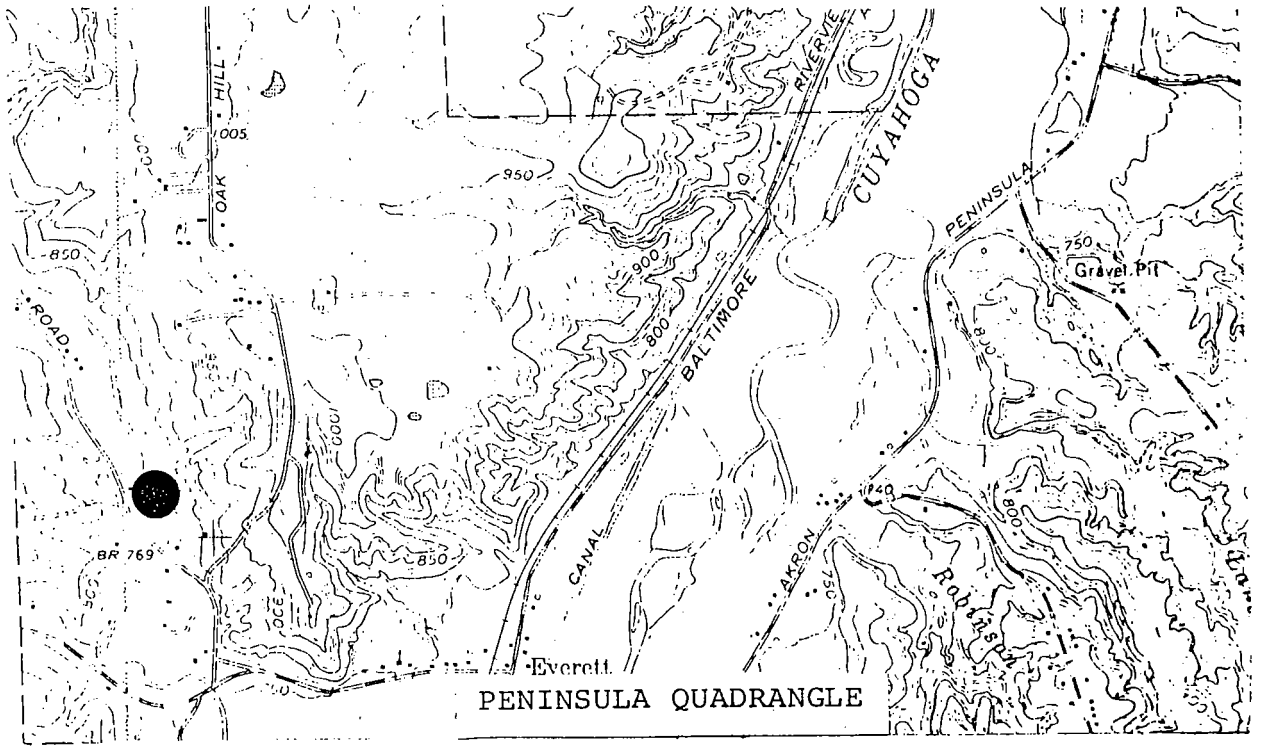
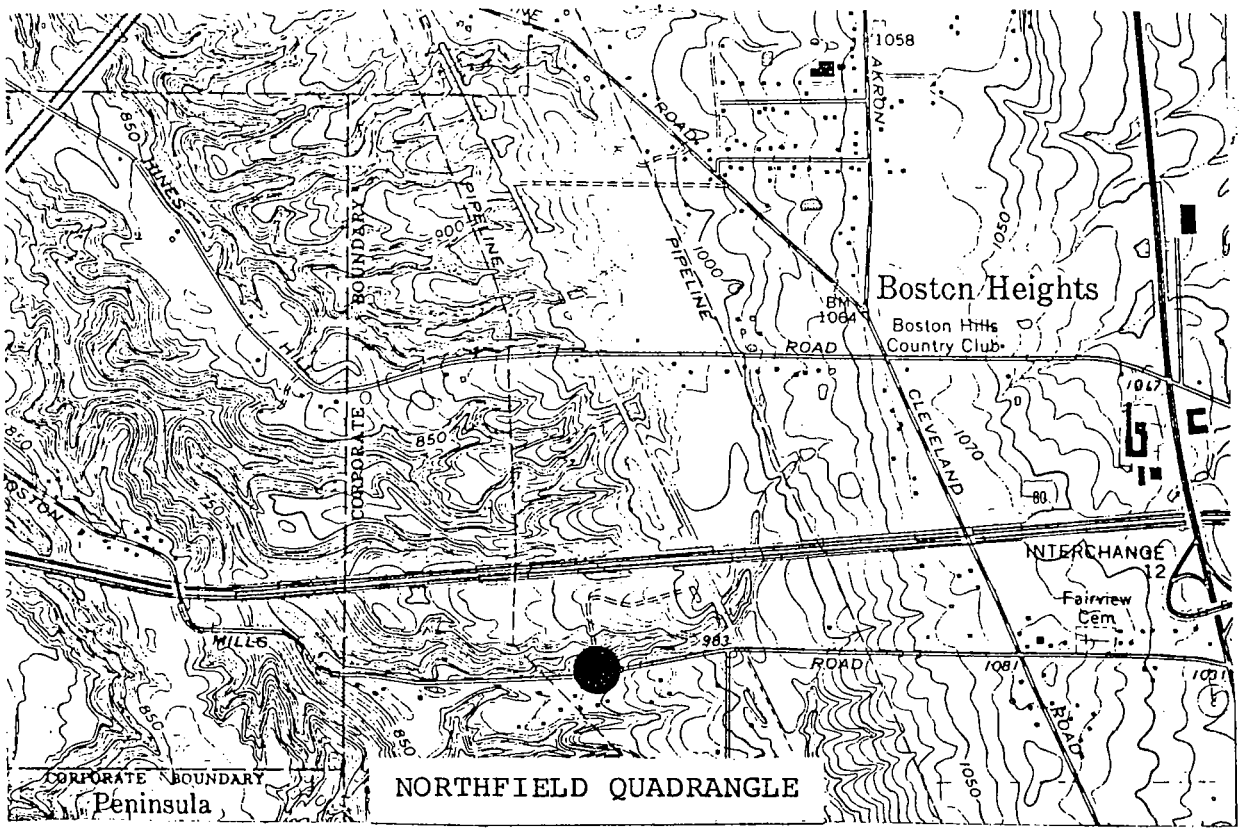


Fig. 62a. Sighting localities for Mink.



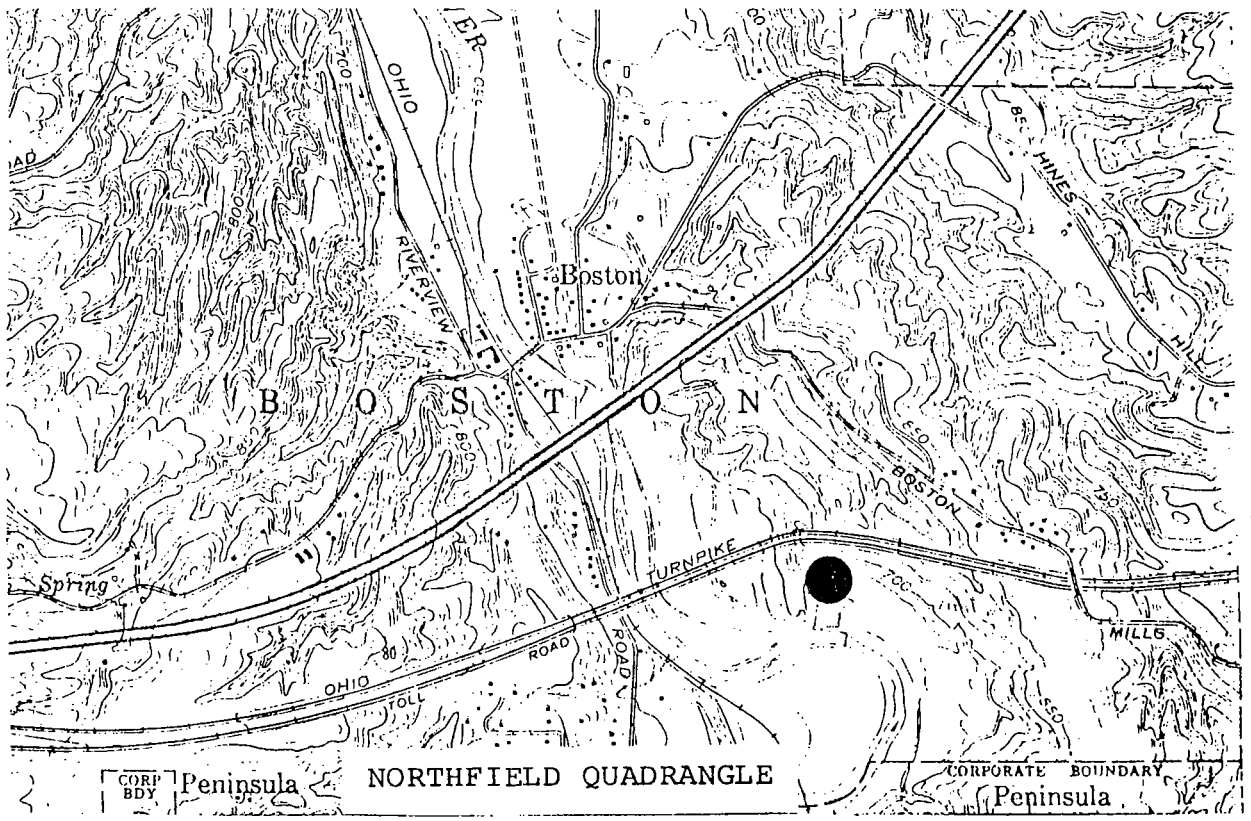
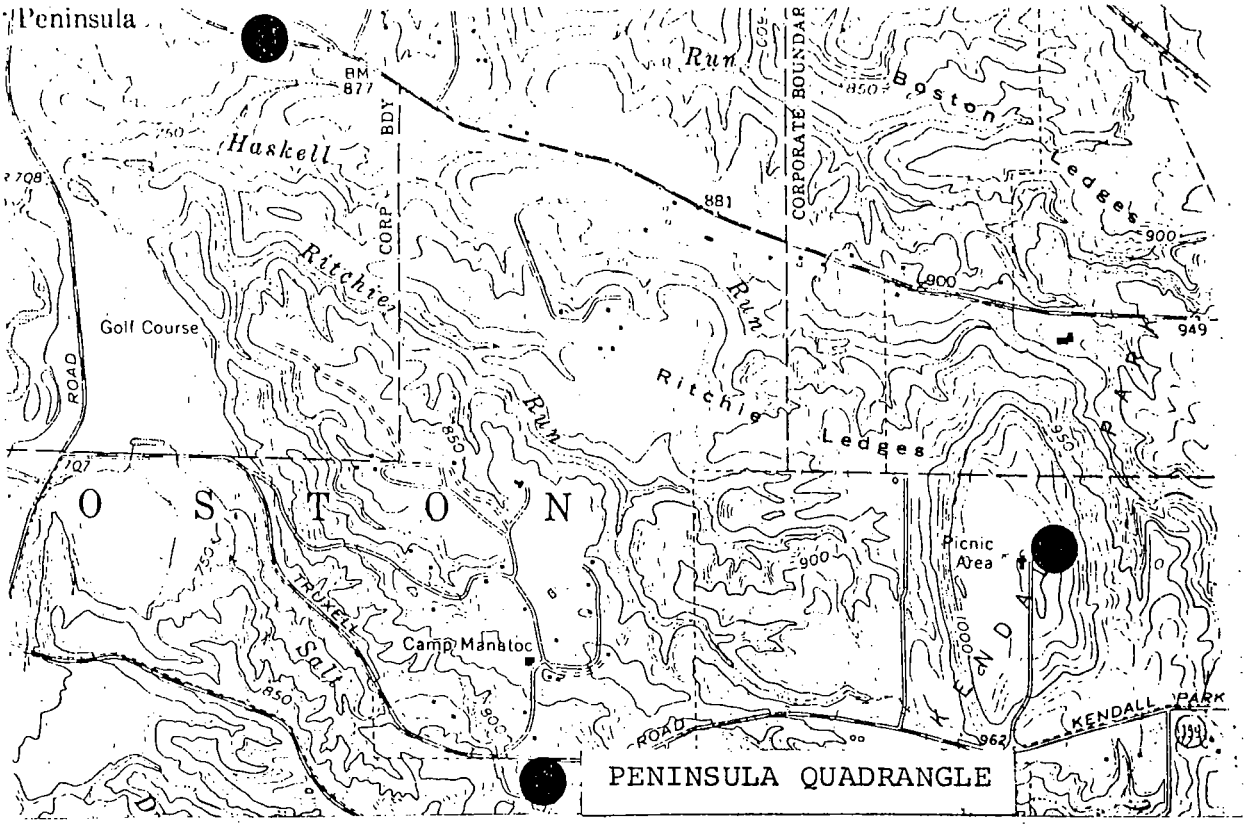


Fig. 62b. Sighting localities for Mink.



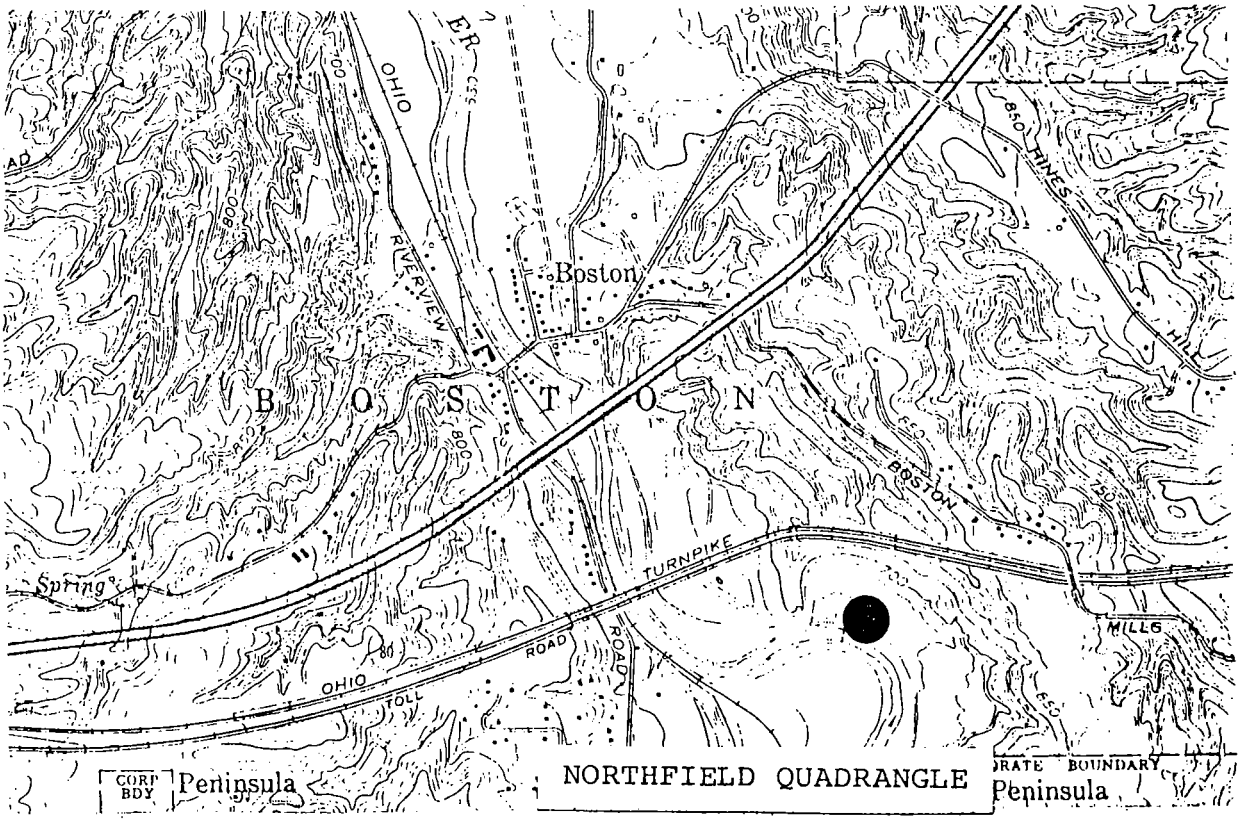


Fig. 63. Sighting localities for Striped Skunks.

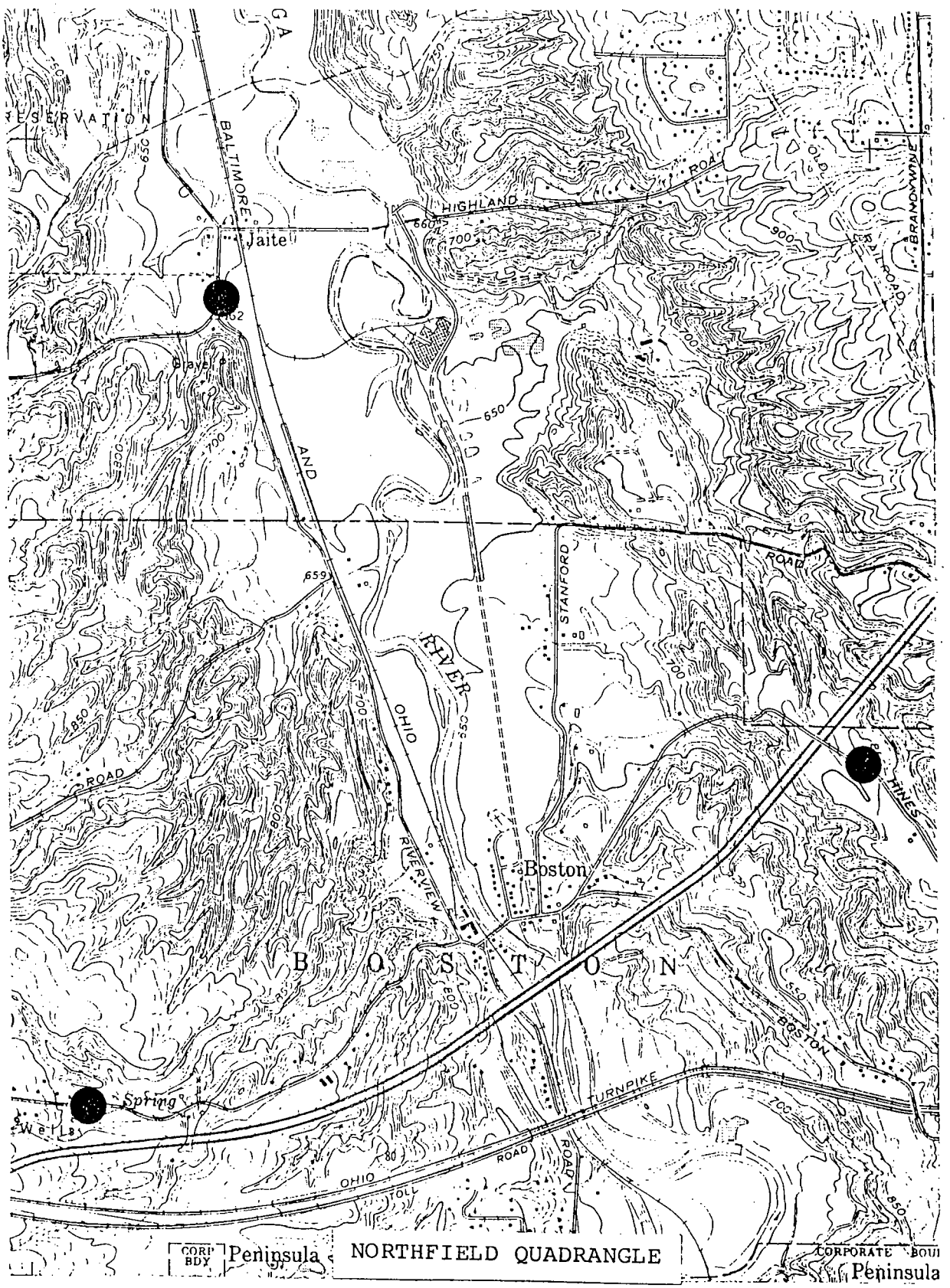
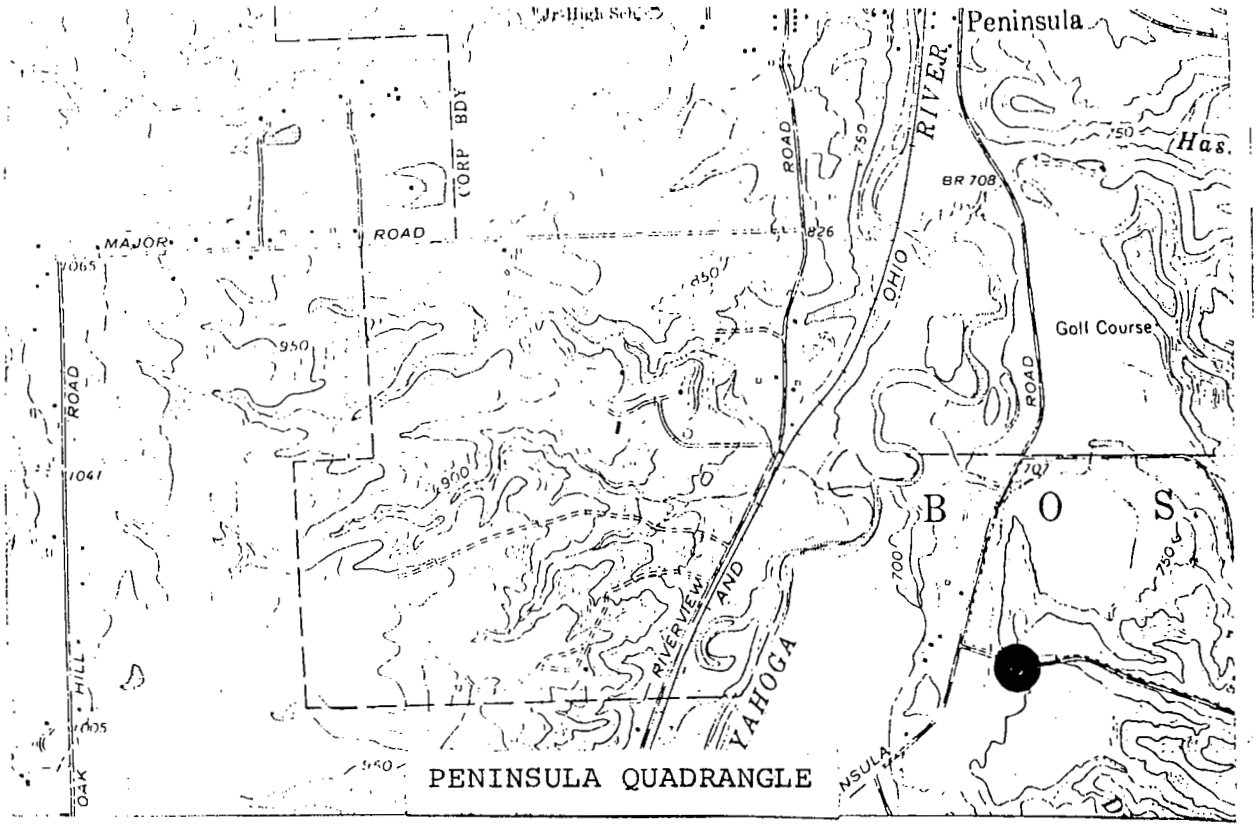


Fig. 64a. Sighting localities for White-tailed Deer.



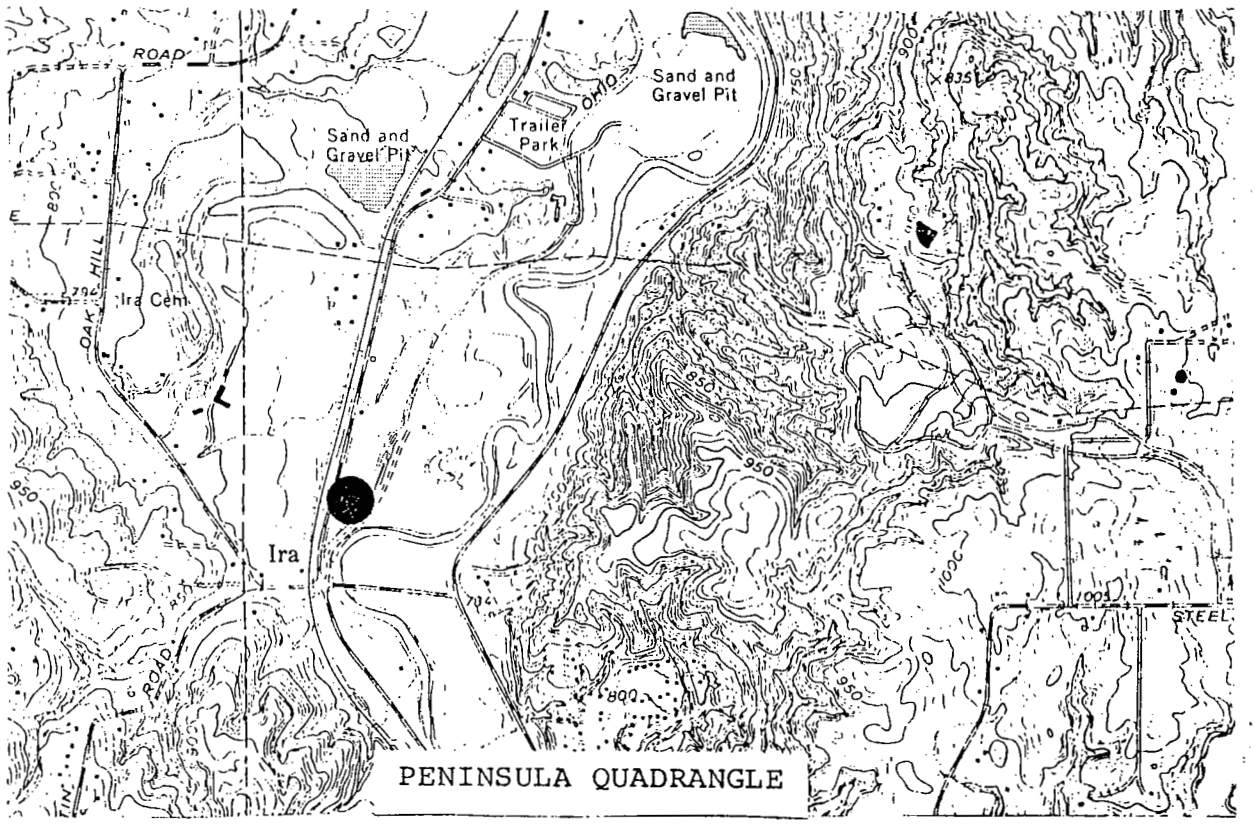


Fig. 64b. Sighting localities for the White-tailed Deer.

ORDER: Artiodactyla

FAMILY: Cervidae

White-tailed Deer, Odocoileus virginianus (Boddart)

Deer numbers are increasing in the Park, probably in response to the abundant food and cover which is developing on the abandoned farmlands. It is interesting to note that like the beaver, the White-tailed Deer was extirpated from Ohio in the early part of this century. Both are making a strong comeback.

LOCALITIES: Figs. 64a, 64b. Riverview Rd. near town of Jaite; Boston Mills Rd. near waterfall; Hines Rd. hill; Quick Rd. near Akron-Peninsula Rd.; Oxbow Lake area; 10 pt. buck dead in canal-probably died from injuries sustained from automobile.

CURRENT STATUS: Frequent and increasing in number.

Birds

SUMMER BIRD LIST Available literature on species biology and reports of field observations indicated that 150 species comprise the summer avifauna of CVNRA (Table 1). This list excludes an approximately equal-sized group, 167 species, from the 317 species which may be listed for the Cleveland and northeastern Ohio region. This all-season cumulative total was abstracted from the basic lists of Williams (1950) and Newman (1969); and from other Ohio studies (Sutton 1928, Hicks 1933, Aldrich 1934, Williams 1936, 1947, Trautman 1940, Grimm 1952, Perner 1955, Trautman and Trautman 1968, Pherson

1974, Jack McCormick and Associates, Inc. 1975, Sturtevandt 1979, CMNH 1982, Hafner 1984, ODNR n.d.); and from review of recent volumes of Ohio Cardinal and Cleveland Bird Calendar .

Species Excluded All non-summer species, even if usually common at another season, were excluded. These non-breeding winter residents and spring/fall migrants were beyond the scope of the project. Species whose occurrences at CVNRA in summer are apparently accidental were also excluded. Accidentals-- crippled stragglers or wind-blown storm victims or evicted wanderers--are living well out of the normal summer range for the species. Despite the attention they may get from birders, it seems inappropriate to assign much importance to them in making management decisions. Lastly, the great-lake shore species which reside nearby in summer but have no substantial habitat in CVNRA were excluded. These species are dependent on Lake Erie habitats and could not subsist long in the valley.

Some excluded migrating species are known to visit the valley soon after midsummer (Table 5). They deserve recognition as species to which summer conditions at CVNRA must be important. For example, the Olive-sided Flycatcher is evidently a predictable late-summer migrant attracted to the coniferous and boreal habitats in CVNRA.

Some excluded birds have borderline or questionable status. Double-crested Cormorant, Bewick's Wren, and Dickcissel were excluded because there seems to be no substantial habitat for them. Merlin, Yellow-bellied Sapsucker, Cliff Swallow, and Northern Parula were excluded for lack of breeding records for the area, although it is not

TABLE 4. CVNRA Summer Bird Species

Explanatory Notes

a All species listed have been encountered at or near CVNRA property during the present year or during the recent past:
UPPER CASE = regularly occurring species.
Mixed Case = irregularly occurring species.

b Entries summarize encounters during summer 1983:
number = encountered by DW.
(number) = encountered by other personnel.
0 = not encountered.
(0) = no adequate search attempted.
M = encountered as migrant only.
✓ = federal endangered species

c Abbreviations identify habitats as named and numbered on existing CVNRA Vegetation Study map (USDI-Park Service, 1979):
Mplsyc = maple-sycamore forest, Number 1
(wet woodlands along waterways with mature soil)
Oabema = oak-beech-maple forest, Numbers 2 and 5 combined
(elevated moist woodlands with mature soil)
Oakhic = oak-hickory forest, Number 4
(elevated dry woodlands with mature soil)
Wetmdw = wet meadow, Number 7
(open thickets of standing or flowing waters and shores)
Hmlkbe = hemlock-beech forest, Numbers 3 and 10 combined
(mixed woodland on moist heavily shaded slopes)
Pnsprc = pine-spruce forest, Number 11
(conifer plantation areas with mature soil)
Scrbof = scrub--old-field, Number 6
(open thickets of cleared lands)
Cltsub = cultivated-suburban land, Numbers 8 and 9 combined
(repeatedly disturbed cropland, orchards, pastures, yards)
Brnlnd = barren land, Number 12
(severely disturbed lands with underdeveloped soil)

d Entries summarize importance of habitat for occurrence in CVNRA:
++ = high importance
+ = some importance
- = no significance

Table 4A. Encounters of Birds and Evaluation of CVNRA Deciduous Woodland Habitat

Identification Number and Common Name a	Encounter Status b	Habitat c Potential d		
		Mplsyc	Oabema	Oakhic
1. PIED-BILLED GREBE	1.	-	-	-
2. GREAT BLUE HERON	2.	-	-	-
3. GREEN-BACKED HERON	3.	-	-	-
4. Great Egret	0	-	-	-
5. Black-crowned Night-Heron	0	-	-	-
6. Yellow-crowned Night-Heron	0	-	-	-
7. LEAST BITTERN	(0)	-	-	-
8. AMERICAN BITTERN	4.	-	-	-
9. CANADA GOOSE	5.	-	-	-
10. MALLARD	6.	-	-	-
11. AMERICAN BLACK DUCK	0	-	-	-
12. Blue-winged Teal	7.	-	-	-
13. WOOD DUCK	8.	+	-	-
14. Ruddy Duck	0	-	-	-
15. Hooded Merganser	0	+	-	-
16. TURKEY VULTURE	9.	-	+	+
17. SHARP-SHINNED HAWK	0	-	+	+
18. COOPER'S HAWK	0	-	+	+
19. RED-TAILED HAWK	10.	+	-	-
20. RED-SHOULDERED HAWK	11.	++	+	-
21. BROAD-WINGED HAWK	12.	-	++	+
√22. Bald Eagle	0	+	-	-
23. Northern Harrier	0	-	-	-
24. Osprey	(13)	+	-	-
25. AMERICAN KESTREL	14.	-	-	-
26. Wild Turkey	(15)	-	+	+
27. RUFFED GROUSE	16.	-	++	++
28. NORTHERN BOBWHITE	17.	-	-	-
29. RING-NECKED PHEASANT	18.	-	-	-
√30. KING RAIL	(19)	-	-	-
31. VIRGINIA RAIL	20.	-	-	-
32. SORA	21.	-	-	-
33. COMMON MOORHEN	22.	-	-	-
34. American Coot	0	-	-	-
35. KILLDEER	23.	-	-	-
36. Upland Sandpiper	0	-	-	-
37. SPOTTED SANDPIPER	24.	-	-	-
38. AMERICAN WOODCOCK	25.	+	-	-
39. COMMON SNIPE	26.	-	-	-
40. Ring-billed Gull	27.	-	-	-
41. Black Tern	0	-	-	-
42. ROCK DOVE	28.	-	-	-
43. MOURNING DOVE	29.	-	-	-
44. YELLOW-BILLED CUCKOO	30.	++	+	-
45. BLACK-BILLED CUCKOO	31.	-	+	-
46. COMMON BARN-OWL	(0)	+	-	-
47. EASTERN SCREECH-OWL	(0)	+	+	+
48. GREAT HORNED OWL	(0)	+	+	+
49. BARRED OWL	32.	++	+	-
50. Northern Saw-whet Owl	(0)	-	-	-

Table 4A. Encounters of Birds and Evaluation of CVNRA Deciduous Woodland Habitat (continued)

Identification Number and Common Name a	Encounter Status b	Habitat c Potential d		
		Mplsyc	Oabema	Oakhic
51. Long-eared Owl	(0)	-	-	+
52. Whip-poor-will	(0)	-	+	+
53. COMMON NIGHTHAWK	(0)	-	-	-
54. CHIMNEY SWIFT	33.	+	+	-
55. RUBY-THROATED HUMMINGBIRD	34.	++	+	-
56. BELTED KINGFISHER	35.	-	-	-
57. NORTHERN FLICKER	36.	-	-	-
58. PILEATED WOODPECKER	37.	++	+	-
59. RED-BELLIED WOODPECKER	38.	+	++	+
60. RED-HEADED WOODPECKER	39.	+	+	+
61. HAIRY WOODPECKER	40.	-	++	-
62. DOWNY WOODPECKER	41.	++	+	-
63. EASTERN KINGBIRD	42.	-	-	-
64. GREAT CRESTED FLYCATCHER	43.	+	++	+
65. EASTERN PHOEBE	44.	+	+	-
66. ACADIAN FLYCATCHER	45.	-	++	-
67. WILLOW FLYCATCHER	46.	-	-	-
68. LEAST FLYCATCHER	47.	-	-	-
69. EASTERN WOOD-PEWEE	48.	++	++	+
70. Horned Lark	0	-	-	-
71. TREE SWALLOW	49.	-	-	-
72. BANK SWALLOW	50.	-	-	-
73. ROUGH-WINGED SWALLOW	51.	-	-	-
74. BARN SWALLOW	52.	-	-	-
75. PURPLE MARTIN	53.	-	-	-
76. BLUE JAY	54.	+	+	+
77. AMERICAN CROW	55.	+	+	+
78. BLACK-CAPPED CHICKADEE	56.	+	+	+
79. TUFTED TITMOUSE	57.	+	++	+
80. WHITE-BREASTED NUTHATCH	58.	+	++	+
81. Red-breasted Nuthatch	0	-	-	-
82. Brown Creeper	0	-	+	-
83. HOUSE WREN	59.	++	-	-
84. Carolina Wren	0	+	-	-
85. Sedge Wren	0	-	-	-
86. MARSH WREN	60.	-	-	+
87. Northern Mockingbird	0	-	-	-
88. GREY CATBIRD	61.	-	+	-
89. BROWN THRASHER	62.	-	-	-
90. AMERICAN ROBIN	63.	-	+	-
91. WOOD THRUSH	64.	-	++	+
92. VEERY	65.	-	++	-
93. EASTERN BLUEBIRD	66.	-	-	-
94. BLUE-GRAY GNATCATCHER	67.	+	+	++
95. CEDAR WAXWING	68.	-	-	-
96. Loggerhead Shrike	0	-	-	-
97. EUROPEAN STARLING	69.	+	-	+
98. WHITE-EYED VIREO	70.	+	-	-
99. SOLITARY VIREO	71.	-	-	+
100. YELLOW-THROATED VIREO	72.	++	+	-

Table 4A. Encounters of Birds and Evaluation of CVNRA Deciduous Woodland Habitat (continued).

Identification Number and Common Name a	Encounter Status b	Habitat c Potential d Mplsyc	Oabema	Oakhic
101. RED-EYED VIREO	73.	+	++	+
102. WARBLING VIREO	74.	-	-	+
103. Black-and-white Warbler	M	+	-	-
104. PROTHONOTARY WARBLER	0	+	-	-
105. BLUE-WINGED WARBLER	75.	-	-	-
106. Golden-winged Warbler	0	-	-	-
107. YELLOW WARBLER	76.	-	-	-
108. Magnolia Warbler	M	+	-	-
109. Black-throated Blue Warbler	0	-	-	-
110. Black-throated Green Warbler	M	-	-	-
111. CERULEAN WARBLER	77.	+	++	-
112. Blackburnian Warbler	M	+	-	-
113. Yellow-throated Warbler	0	+	-	-
114. Chestnut-sided Warbler	M	-	-	+
115. PRAIRIE WARBLER	78.	-	-	+
116. OVENBIRD	79.	-	+	++
117. Kentucky Warbler	0	+	+	-
118. Northern Waterthrush	0	-	-	-
119. LOUISIANA WATERTHRUSH	80.	++	-	-
120. COMMON YELLOWTHROAT	81.	-	-	-
121. YELLOW-BREASTED CHAT	82.	-	-	-
122. HOODED WARBLER	83.	++	+	-
123. Canada Warbler	M	+	-	-
124. AMERICAN REDSTART	84.	++	+	+
125. HOUSE SPARROW	85.	-	-	-
126. BOBOLINK	86.	-	-	-
127. EASTERN MEADOWLARK	87.	-	-	-
128. RED-WINGED BLACKBIRD	88.	-	-	-
129. Orchard Oriole	0	+	-	-
130. NORTHERN ORIOLE	89.	++	+	+
131. COMMON GRACKLE	90.	-	-	-
132. BROWN-HEADED COWBIRD	91.	+	+	+
133. SCARLET TANAGER	92.	-	++	-
134. NORTHERN CARDINAL	93.	+	+	-
135. ROSE-BREASTED GROSBEAK	94.	+	+	-
136. INDIGO BUNTING	95.	++	+	+
137. PURPLE FINCH	96.	-	-	-
138. HOUSE FINCH	97.	-	-	-
139. Pine Siskin	0	-	-	-
140. AMERICAN GOLDFINCH	98.	-	-	-
141. RUFOUS-SIDED TOWHEE	99.	-	-	-
142. Savannah Sparrow	0	-	-	-
143. GRASSHOPPER SPARROW	100.	-	-	-
144. HENSLOW'S SPARROW	0	-	-	-
145. Vesper Sparrow	0	-	-	-
146. Dark-eyed Junco	M	-	-	-
147. CHIPPING SPARROW	101.	-	-	+
148. FIELD SPARROW	102.	-	-	-
149. SWAMP SPARROW	103.	-	-	-
150. SONG SPARROW	104.	-	-	-

Table 4B. Encounters of Birds and Evaluation of CVNRA Marsh and Conifer Woodland Habitat

Identification Number and Common Name a	Encounter Status b	Habitat c	Potential d	
		Wetmdw	Hmlkbe	Pnsprc
1. PIED-BILLED GREBE	1.	++	-	-
2. GREAT BLUE HERON	2.	++	-	-
3. GREEN-BACKED HERON	3.	++	-	-
4. Great Egret	0	+	-	-
5. Black-crowned Night-Heron	0	+	-	-
6. Yellow-crowned Night-Heron	0	+	-	-
7. LEAST BITTERN	(0)	++	-	-
8. AMERICAN BITTERN	4.	++	-	-
9. CANADA GOOSE	5.	++	-	-
10. MALLARD	6.	++	-	-
11. AMERICAN BLACK DUCK	0	++	-	-
12. Blue-winged Teal	7.	+	-	-
13. WOOD DUCK	8.	++	-	-
14. Ruddy Duck	0	+	-	-
15. Hooded Merganser	0	+	-	-
16. TURKEY VULTURE	9.	-	+	++
17. SHARP-SHINNED HAWK	0	-	+	++
18. COOPER'S HAWK	0	-	+	+
19. RED-TAILED HAWK	10.	-	-	-
20. RED-SHOULDERED HAWK	11.	-	+	-
21. BROAD-WINGED HAWK	12.	-	-	-
√22. Bald Eagle	0	+	-	-
23. Northern Harrier	0	+	-	-
24. Osprey	(13)	+	-	-
25. AMERICAN KESTREL	14.	-	-	-
26. Wild Turkey	(15)	-	-	-
27. RUFFED GROUSE	16.	-	-	+
28. NORTHERN BOBWHITE	17.	-	-	-
29. RING-NECKED PHEASANT	18.	+	-	-
√30. KING RAIL	(19)	++	-	-
31. VIRGINIA RAIL	20.	++	-	-
32. SORA	21.	++	-	-
33. COMMON MOORHEN	22.	++	-	-
34. American Coot	0	+	-	-
35. KILLDEER	23.	-	-	-
36. Upland Sandpiper	0	-	-	-
37. SPOTTED SANDPIPER	24.	++	-	-
38. AMERICAN WOODCOCK	25.	+	-	-
39. COMMON SNIPE	26.	++	-	-
40. Ring-billed Gull	27.	+	-	-
41. Black Tern	0	+	-	-
42. ROCK DOVE	28	-	-	-
43. MOURNING DOVE	29.	-	-	++
44. YELLOW-BILLED CUCKOO	30.	+	-	-
45. BLACK-BILLED CUCKOO	31.	-	-	-
46. COMMON BARN-OWL	(0)	-	-	-
47. EASTERN SCREECH-OWL	(0)	-	+	+
48. GREAT HORNED OWL	(0)	-	+	+
49. BARRED OWL	32.	-	+	+
50. Northern Saw-whet Owl	(0)	-	+	+

Table 4B. Encounters of Birds and Evaluation of CVNRA Marsh and Conifer Woodland Habitat (continued).

Identification Number and Common Name a	Encounter Status b	Habitat c Potential d Wetmdw	Hmlkbe	Pnsprc
51. Long-eared Owl	(0)	-	+	+
52. Whip-poor-will	(0)	-	-	-
53. COMMON NIGHTHAWK	(0)	-	-	-
54. CHIMNEY SWIFT	33.	-	-	-
55. RUBY-THROATED HUMMINGBIRD	34.	-	-	-
56. BELTED KINGFISHER	35.	++	-	-
57. NORTHERN FLICKER	36.	-	-	-
58. PILEATED WOODPECKER	37.	-	-	-
59. RED-BELLIED WOODPECKER	38.	-	-	-
60. RED-HEADED WOODPECKER	39.	-	-	-
61. HAIRY WOODPECKER	40.	-	-	-
62. DOWNY WOODPECKER	41.	+	-	-
63. EASTERN KINGBIRD	42.	++	-	-
64. GREAT CRESTED FLYCATCHER	43.	-	-	-
65. EASTERN PHOEBE	44.	++	+	-
66. ACADIAN FLYCATCHER	45.	-	+	-
67. WILLOW FLYCATCHER	46.	++	-	-
68. LEAST FLYCATCHER	47.	-	-	-
69. EASTERN WOOD-PEWEE	48.	-	-	-
70. Horned Lark	0	-	-	-
71. TREE SWALLOW	49.	++	-	-
72. BANK SWALLOW	50.	++	-	-
73. ROUGH-WINGED SWALLOW	51.	++	-	-
74. BARN SWALLOW	52.	+	-	-
75. PURPLE MARTIN	53.	-	-	-
76. BLUE JAY	54.	-	+	+
77. AMERICAN CROW	55.	-	-	++
78. BLACK-CAPPED CHICKADEE	56.	+	+	+
79. TUFTED TITMOUSE	57.	-	-	+
80. WHITE-BREASTED NUTHATCH	58.	-	+	+
81. Red-breasted Nuthatch	0	-	+	+
82. Brown Creeper	0	-	+	+
83. HOUSE WREN	59.	-	-	-
84. Carolina Wren	0	-	-	-
85. Sedge Wren	0	+	-	-
86. MARSH WREN	60.	++	-	-
87. Northern Mockingbird	0	-	-	-
88. GREY CATBIRD	61.	-	-	-
89. BROWN THRASHER	62.	-	-	-
90. AMERICAN ROBIN	63.	-	-	-
91. WOOD THRUSH	64.	-	-	-
92. VEERY	65.	-	+	-
93. EASTERN BLUEBIRD	66.	+	-	-
94. BLUE-GRAY GNATCATCHER	67.	-	-	-
95. CEDAR WAXWING	68.	-	+	+
96. Loggerhead Shrike	0	-	-	-
97. EUROPEAN STARLING	69.	-	-	-
98. WHITE-EYED VIREO	70.	+	-	-
99. SOLITARY VIREO	71.	-	++	+
100. YELLOW-THROATED VIREO	72.	-	-	-

Table 4B. Encounters of Birds and Evaluation of CVNRA Marsh and Conifer Woodland Habitat (continued).

Identification Number and Common Name a	Encounter Status b	Habitat c Potential d		
		Wetmdw	Hmlkbe	Pnsprc
101. RED-EYED VIREO	73.	-	-	-
102. WARBLING VIREO	74.	-	-	-
103. Black-and-white Warbler	M	-	+	-
104. PROTHONOTARY WARBLER	0	++	-	-
105. BLUE-WINGED WARBLER	75.	-	-	-
106. Golden-winged Warbler	0	-	-	-
107. YELLOW WARBLER	76.	+	-	-
108. Magnolia Warbler	M	-	+	+
109. Black-throated Blue Warbler	0	-	+	+
110. Black-throated Green Warbler	M	-	+	+
111. CERULEAN WARBLER	77.	-	-	-
112. Blackburnian Warbler	M	-	+	+
113. Yellow-throated Warbler	0	-	+	-
114. Chestnut-sided Warbler	M	-	-	-
115. PRAIRIE WARBLER	78.	-	-	+
116. OVENBIRD	79.	-	-	-
117. Kentucky Warbler	0	-	-	-
118. Northern Waterthrush	0	-	+	-
119. LOUISIANA WATERTHRUSH	80.	+	+	-
120. COMMON YELLOWTHROAT	81.	++	-	-
121. YELLOW-BREASTED CHAT	82.	+	-	-
122. HOODED WARBLER	83.	-	+	-
123. Canada Warbler	M	-	+	-
124. AMERICAN REDSTART	84.	-	-	-
125. HOUSE SPARROW	85.	-	-	+
126. BOBOLINK	86.	-	-	-
127. EASTERN MEADOWLARK	87.	-	-	-
128. RED-WINGED BLACKBIRD	88.	++	-	-
129. Orchard Oriole	0	-	-	-
130. NORTHERN ORIOLE	89.	-	-	-
131. COMMON GRACKLE	90.	+	-	++
132. BROWN-HEADED COWBIRD	91.	-	-	-
133. SCARLET TANAGER	92.	-	-	-
134. NORTHERN CARDINAL	93.	-	-	-
135. ROSE-BREASTED GROSBEAK	94.	-	-	-
136. INDIGO BUNTING	95.	+	-	-
137. PURPLE FINCH	96.	-	+	+
138. HOUSE FINCH	97.	-	-	+
139. Pine Siskin	0	-	+	+
140. AMERICAN GOLDFINCH	98.	-	-	-
141. RUFOUS-SIDED TOWHEE	99.	-	-	-
142. Savannah Sparrow	0	-	-	-
143. GRASSHOPPER SPARROW	100.	-	-	-
144. HENSLOW'S SPARROW	0	-	-	-
145. Vesper Sparrow	0	-	-	-
146. Dark-eyed Junco	M	-	+	+
147. CHIPPING SPARROW	101.	-	+	+
148. FIELD SPARROW	102.	-	-	-
149. SWAMP SPARROW	103.	++	-	-
150. SONG SPARROW	104.	++	-	-

Table 4C. Encounters of Birds and Evaluation of CVNRA Disturbed Habitat

Identification Number and Common Name a	Encounter Status b	Habitat c Potential d		
		Scrbof	Cltsub	Brnlnd
1. PIED-BILLED GREBE	1.	-	-	-
2. GREAT BLUE HERON	2.	-	-	-
3. GREEN-BACKED HERON	3.	-	-	-
4. Great Egret	0	-	-	-
5. Black-crowned Night-Heron	0	-	-	-
6. Yellow-crowned Night-Heron	0	-	-	-
7. LEAST BITTERN	(0)	-	-	-
8. AMERICAN BITTERN	4.	-	-	-
9. CANADA GOOSE	5.	-	-	-
10. MALLARD	6.	-	-	-
11. AMERICAN BLACK DUCK	0	-	-	-
12. Blue-winged Teal	7.	-	-	-
13. WOOD DUCK	8.	-	-	-
14. Ruddy Duck	0	-	-	-
15. Hooded Merganser	0	-	-	-
16. TURKEY VULTURE	9.	+	+	+
17. SHARP-SHINNED HAWK	0	-	-	-
18. COOPER'S HAWK	0	+	-	-
19. RED-TAILED HAWK	10.	+	++	+
20. RED-SHOULDERED HAWK	11.	+	-	-
21. BROAD-WINGED HAWK	12.	+	-	-
√22. Bald Eagle	0	-	-	-
23. Northern Harrier	0	-	-	-
24. Osprey	(13)	-	-	-
25. AMERICAN KESTREL	14.	++	++	+
26. Wild Turkey	(15)	+	-	-
27. RUFFED GROUSE	16.	+	-	-
28. NORTHERN BOBWHITE	17.	++	+	-
29. RING-NECKED PHEASANT	18.	+	++	-
√30. KING RAIL	(19)	-	-	-
31. VIRGINIA RAIL	20.	-	-	-
32. SORA	21.	-	-	-
33. COMMON MOORHEN	22.	-	-	-
34. American Coot	0	-	-	-
35. KILLDEER	23.	-	+	++
36. Upland Sandpiper	0	-	+	+
37. SPOTTED SANDPIPER	24.	-	-	-
38. AMERICAN WOODCOCK	25.	++	-	-
39. COMMON SNIPE	26.	-	-	-
40. Ring-billed Gull	27.	-	+	-
41. Black Tern	0	-	-	-
42. ROCK DOVE	28.	+	++	+
43. MOURNING DOVE	29.	+	++	+
44. YELLOW-BILLED CUCKOO	30.	+	-	-
45. BLACK-BILLED CUCKOO	31.	++	-	-
46. COMMON BARN-OWL	(0)	+	+	-
47. EASTERN SCREECH-OWL	(0)	+	+	-
48. GREAT HORNED OWL	(0)	+	+	-
49. BARRED OWL	32.	+	+	-
50. Northern Saw-whet Owl	(0)	+	-	-

Table 4C. Encounters of Birds and Evaluation of CVNRA Disturbed Habitat (continued).

Identification Number and Common Name a	Encounter Status b	Habitat c Potential d		
		Scrbof	Cltsub	Brnlnd
51. Long-eared Owl	(0)	+	+	-
52. Whip-poor-will	(0)	+	-	-
53. COMMON NIGHTHAWK	(0)	+	+	+
54. CHIMNEY SWIFT	33.	-	+	-
55. RUBY-THROATED HUMMINGBIRD	34.	+	-	-
56. BELTED KINGFISHER	35.	-	-	+
57. NORTHERN FLICKER	36.	+	++	-
58. PILEATED WOODPECKER	37.	+	-	-
59. RED-BELLIED WOODPECKER	38.	-	-	-
60. RED-HEADED WOODPECKER	39.	+	+	-
61. HAIRY WOODPECKER	40.	+	+	-
62. DOWNY WOODPECKER	41.	+	+	-
63. EASTERN KINGBIRD	42.	+	+	-
64. GREAT CRESTED FLYCATCHER	43.	-	+	-
65. EASTERN PHOEBE	44.	-	+	-
66. ACADIAN FLYCATCHER	45.	-	-	-
67. WILLOW FLYCATCHER	46.	+	-	-
68. LEAST FLYCATCHER	47.	++	+	-
69. EASTERN WOOD-PEWEE	48.	-	-	-
70. Horned Lark	0	-	+	+
71. TREE SWALLOW	49.	-	-	-
72. BANK SWALLOW	50.	-	-	++
73. ROUGH-WINGED SWALLOW	51.	-	-	+
74. BARN SWALLOW	52.	+	++	-
75. PURPLE MARTIN	53.	-	++	-
76. BLUE JAY	54.	-	+	-
77. AMERICAN CROW	55.	+	+	-
78. BLACK-CAPPED CHICKADEE	56.	+	+	-
79. TUFTED TITMOUSE	57.	-	+	-
80. WHITE-BREASTED NUTHATCH	58.	-	+	-
81. Red-breasted Nuthatch	0	-	-	-
82. Brown Creeper	0	-	-	-
83. HOUSE WREN	59.	+	+	-
84. Carolina Wren	0	+	+	-
85. Sedge Wren	0	-	-	-
86. MARSH WREN	60.	-	-	-
87. Northern Mockingbird	0	+	+	-
88. GREY CATBIRD	61.	++	+	-
89. BROWN THRASHER	62.	++	+	-
90. AMERICAN ROBIN	63.	+	++	-
91. WOOD THRUSH	64.	-	-	-
92. VEERY	65.	+	-	-
93. EASTERN BLUEBIRD	66.	++	+	-
94. BLUE-GRAY GNATCATCHER	67.	+	-	-
95. CEDAR WAXWING	68.	+	+	-
96. Loggerhead Shrike	0	++	+	+
97. EUROPEAN STARLING	69.	-	++	-
98. WHITE-EYED VIREO	70.	++	-	-
99. SOLITARY VIREO	71.	+	-	-
100. YELLOW-THROATED VIREO	72.	-	-	-

Table 4C. Encounters of Birds and Evaluation of CVNRA Disturbed Habitat (continued).

Identification Number and Common Name a	Encounter Status b	Habitat c Potential d		
		Scrbof	Cltsub	Brnlnd
101. RED-EYED VIREO	73.	-	-	-
102. WARBLING VIREO	74.	+	++	-
103. Black-and-white Warbler	M	-	-	-
104. PROTHONOTARY WARBLER	0	-	-	-
105. BLUE-WINGED WARBLER	75.	++	-	-
106. Golden-winged Warbler	0	+	-	-
107. YELLOW WARBLER	76.	++	-	-
108. Magnolia Warbler	M	-	-	-
109. Black-throated Blue Warbler	0	-	-	-
110. Black-throated Green Warbler	M	-	-	-
111. CERULEAN WARBLER	77.	-	-	-
112. Blackburnian Warbler	M	-	-	-
113. Yellow-throated Warbler	0	-	-	-
114. Chestnut-sided Warbler	M	+	-	-
115. PRAIRIE WARBLER	78.	++	-	-
116. OVENBIRD	79.	-	-	-
117. Kentucky Warbler	0	-	-	-
118. Northern Waterthrush	0	-	-	-
119. LOUISIANA WATERTHRUSH	80.	-	-	-
120. COMMON YELLOWTHROAT	81.	+	-	-
121. YELLOW-BREASTED CHAT	82.	++	-	-
122. HOODED WARBLER	83.	-	-	-
123. Canada Warbler	M	-	-	-
124. AMERICAN REDSTART	84.	-	-	-
125. HOUSE SPARROW	85.	-	++	-
126. BOBOLINK	86.	++	+	-
127. EASTERN MEADOWLARK	87.	+	++	+
128. RED-WINGED BLACKBIRD	88.	-	+	-
129. Orchard Oriole	0	+	+	-
130. NORTHERN ORIOLE	89.	-	+	-
131. COMMON GRACKLE	90.	-	+	-
132. BROWN-HEADED COWBIRD	91.	++	+	-
133. SCARLET TANAGER	92.	-	-	-
134. NORTHERN CARDINAL	93.	+	+	-
135. ROSE-BREASTED GROSBEAK	94.	+	-	-
136. INDIGO BUNTING	95.	+	++	-
137. PURPLE FINCH	96.	++	+	-
138. HOUSE FINCH	97.	+	+	-
139. Pine Siskin	0	-	-	-
140. AMERICAN GOLDFINCH	98.	++	+	-
141. RUFOUS-SIDED TOWHEE	99.	++	-	-
142. Savannah Sparrow	0	-	+	-
143. GRASSHOPPER SPARROW	100.	+	+	-
144. HENSLOW'S SPARROW	0	-	+	-
145. Vesper Sparrow	0	-	+	-
146. Dark-eyed Junco	M	-	-	-
147. CHIPPING SPARROW	101.	-	++	-
148. FIELD SPARROW	102.	++	+	-
149. SWAMP SPARROW	103.	-	-	-
150. SONG SPARROW	104.	++	+	-

TABLE 5. Early Migrating or Widely Wandering Bird Species Transient in CVNRA Habitats in Late Summer

Green-winged Teal
Cattle Egret
Semipalmated Plover
Greater Yellowlegs
Lesser Yellowlegs
*Solitary Sandpiper
Least Sandpiper
Baird's Sandpiper
Pectoral Sandpiper
Stilt Sandpiper
*Olive-sided Flycatcher
*White-throated Sparrow

*encountered in the present study

clear why they should be so unreported. Peregrine Falcon and Greater Prairie-Chicken were omitted as species extirpated virtually everywhere in east-central North America, including northeastern Ohio where they formerly occurred. Merlin has been identified as "probably" extirpated by Smith et al. (1973). Of the other species they labeled as extirpated, only Common Merganser and Common Raven could conceivably have been summer residents in northeastern Ohio.

Summer Species Status The 150 species left on the summer CVNRA list all have some potential to breed on CVNRA land, based on record, either historically or recently, of observed activity either at CVNRA itself or in habitats like those on CVNRA within 50 miles of CVNRA. To address the question of differing status among the 150 species left on the list, these were divided into 110 regular and 40 irregular species (Table 4).

Irregular species included those which have not been reported breeding or foraging repeatedly at CVNRA during summer over the past years. The meanings of "repeatedly" and "past" were assigned on the basis of typical abundances of a species, so that those which are never numerous (hawks and owls, for examples) might be considered regular even if there were just one recent record. Also, because in this project direct observation of breeding activity (territoriality) was unlikely for some species (bitterns and hummingbirds, for examples), those for which there is substantial breeding habitat at CVNRA were considered regular even if there were only encounter records.

"Regular" should not be mistaken as "abundant". Some regular apecies in fact may be very low in density but still be a persistent member of the CVNRA summer avifauna--present "repeatedly" over the "past" years.

For most irregular species, CVNRA is close to the edge of normal range--for examples, Northern Saw-whet Owl and Black-throated Green Warbler of the northeastern boreal/montane forests, Blue-winged Teal and Loggerhead Shrike of the north-central grasslands and Yellow-crowned Night-Heron and Kentucky Warbler of the south-central lowland forests. Certain irregular species--Black-crowned Night-Heron, Hooded Merganser, Bald Eagle, Osprey, Wild Turkey, Sedge Wren-- are sporadic and localized within their range, which would include CVNRA. Horned Lark, Savannah Sparrow, and Vesper Sparrow range and breed in northeastern Ohio but were considered irregular because of lack of substantial habitat for them. Whip-poor-will, Brown Creeper, and Black-and-white Warbler were considered irregular because of a lack of breeding records at CVNRA, but it is not clear why they should be so unreported.

Of the regular species, Great Blue Heron and Purple Martin may not breed in CVNRA even though individuals often forage there. Pied-billed Grebe, Least Bittern, American Bittern, Sharp-shinned Hawk, American Kestrel, Ruffed Grouse, King Rail, Common Snipe, Common Barn-Owl, Red-headed Woodpecker, Solitary Vireo, Prairie Warbler, Purple Finch, Grasshopper Sparrow, and Henslow's Sparrow may be so few and so localized that their status as regular should be regarded as questionable.

SITES OF STUDY A total of 24 sites were specifically visited for study of birds in the program. An effort was made to include those habitats that are most extensive and thus characterize the valley as well as those sites of habitats that are unique in the valley. Some sites were visited in part to collect observations for comparison to information reported from earlier studies at the same locales.

Survey Sites Twenty sites were visited for casual observations of birds present (Table 6; Figure 65). In this report, these sites are referred to by the identification numbers which were assigned to them.

Census Sites Four sites were established for intensive censusing (Table 7; Figure 65). In this report, they are identified by names referring to distinguishing characteristics of each, as follows: Boston (after Boston Run, the ravine watercourse which transects it); Bottoms (after bottomland, or riverside lowland, the terrain on which it lies); Blossom (after Blossom Music Center, the famous public recreation facility nearby); and Bishop (after "Bishop Tree Farm", name of the larger parcel when held by its previous owner).

The first three census areas are representative of typical habitats which are most extensive in CVNRA: a upland oak-beech-maple forest; a lowland maple-beech-sycamore forest; and an abandoned, partly cleared field in an early stage of succession. The fourth area was an unusual shrubby mixed deciduous- conifer stand where a colony of Prairie Warblers has attracted some attention. More specific

descriptions of the census sites are presented in Table 7 and Figure 66.

SPECIES ENCOUNTERED Of the 150 summer CVNRA species, 104 (about 70%) were encountered and observed during the project in the field (Table 4). Of the 104 species encountered, 99 (about 95%) were regular species. These 99 constitute about 90% of all 110 regular species; the 5 irregular species encountered are only about 12% of the 40 total irregulars.

In the more homogenous habitats of each census site, species--residents, not visitors--were fewer but rather constant (Table 4): Boston, 28; Bottoms, 29; Blossom, 21; Bishop, 29. All species present were of regular status. Total resident individuals at each census site varied more: Boston, 44.5; Bottoms, 51.5; Blossom, 32.0; Bishop, 70.5.

If species richness were expressed as the frequency of species per individual times total number of species at each site (roughly, an expression of the number of species in a comparably rich "uniform" community of equally abundant species), then the forested sites were the richer and the open sites were the poorer of the four: Boston, 17.6; Bottoms, 16.3; Blossom, 13.8; Bishop, 11.9. Average density per hectare for species was higher at the forested sites and lower at the open sites: Boston, 0.27; Bottoms, 0.28; Blossom, 0.27; Bishop, 0.18.

CVNRA HABITAT EVALUATION For the 150 bird species in the list the relationship between CVNRA habitats and the species was evaluated.

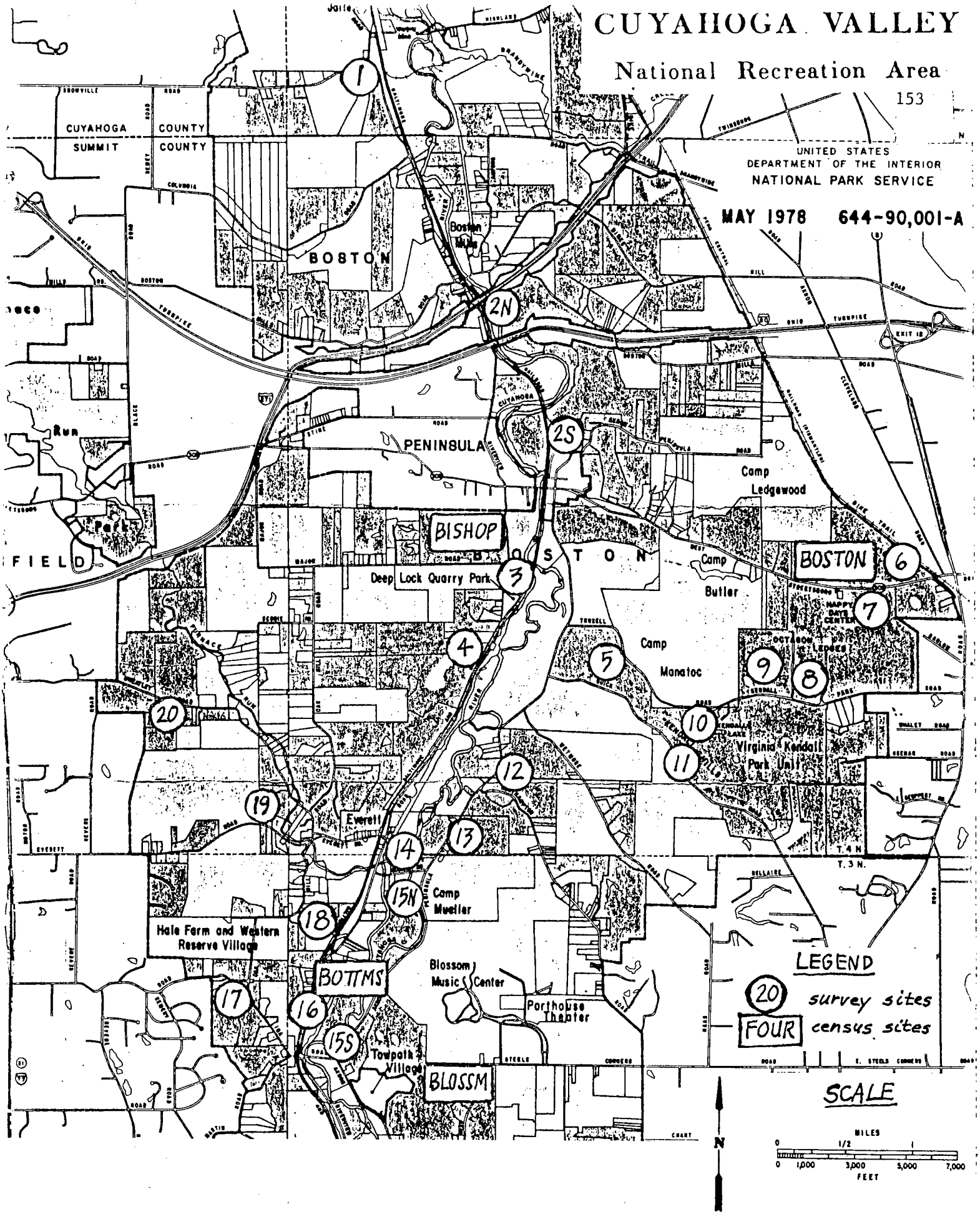


Fig. 65. Locations of Bird Study Sites.

Table 6. Description of Bird Survey Sites

1. Snowville Road Quarry--open barren gravel-pit slopes and pond adjacent to open shrubby fields and oak-maple forest.

2. Peninsula Riverside/Stumpy Basin Lowlands--willow-maple-sycamore forest and adjacent slopes along Cuyahoga River interrupted by cultivated or open shrubby fields

3. Deep Lock Quarry-Roadsides--densely shrubby field adjacent to upland oak-hickory forest and beech-maple ravine forest.

4. Riverview Road Picnic Park--oak-hickory upland forest and beech-maple ravine forest with some abandoned residential clearings and densely shrubby fields.

5. Salt Lick Trail System--beech-maple ravine forest with some hemlock, and adjacent oak-hickory upland forest and dense large pine plantations.

6. Boston Run Trail System--beech-maple ravine forests and oak-hickory upland forest interrupted by moderately open shrubby fields and open mowed fields.

7. Happy Days/Ledges Trail System--beech-maple ravine forests with hemlock and adjacent oak-hickory upland forest.

8. West Ledges Trail System--maple-oak-hickory forest near open shrubby or mowed fields.

9. West Forest Trail System--sycamore-beech-maple ravine forest adjacent to oak-hickory upland forest pine plantation and some open mowed fields.

10. Kendall Lake Trail system--lakeside oak-hickory forest and pine plantation interrupted by open shrubby and mowed fields.

11. Kendall Hills Ski Area--mowed open fields interrupted and surrounded by pine plantation and oak-maple forests and shrub.

12. Akron-Peninsula Road Picnic Park--open mowed and shrubby fields adjacent to maple-oak-hickory forest.

13. Akron-Peninsula Road Quarry--overgrown semi-barren gravel-pit slopes and spoilage surrounded by maple-oak-hickory forest.

14. Szalay Farm Roadsides--cultivated riverside cornfields with scattered large maples, willows, sycamores and shrubby edges.

15. Ira-Bolanz Road Riverside Lowlands--willow-maple-sycarmore forest along Cuyahoga River, interrupted by cultivated fields, open flooded fields, and shrubby fields.

16. Riverview Road Slough Marsh--deeply flooded riverside field, impoundment held by active beaver dams, with scattered sycamores and willows.

17. Hale Farm Fields--open shrubby wet fields and adjacent mowed fields with scattered maples and oaks, bordering slope bearing mixed pine-oak-spruce-maple forest.

18. Riverview Road Quarry--open barren sheer gravel-pit slopes and large pond with adjacent open shrubby fields and oak-maple forests.

19. Everett Road Woods--oak-maple upland woods with some abandoned residential clearings and densely shrubby fields.

20. Wheatley Road Woods--oak-hickory upland forest and beech-maple ravine forest interrupted by moderately open shrubby fields.

Table 7A. Breeding Bird Census Information: Boston

Location : Summit Co., OH, 0.64 mi W of Chittenden Corners, intersection with S.R. 8, on S.R. 303/Streetsboro Road, off road 0.3 mi N; center at 41 13' 59" N 81 30' 14" W in Peninsula Quadrangle, U.S.G.S. (Fig. 66b).

Size : 5.8 ha (14.3 ac), a subrectangular 200 x 300 m tetralateral.

Coverage : May 23, June 8, 15, 29, July 6, 27; each time approximately between 0730 and 1200; totaling 30 party-hours.

Description : Wet/moist ravine and adjacent uplands and limestone-ledge outcrops; east-west lying ravine occupied central 100-m wide strip 200 m long; undisturbed to crest of slopes with canopy providing coverage of 95% of mature beech and some maple; subcanopy mostly of beech saplings, and at streamside, ironwood; scattered groundcover almost entirely small ephemerals--liverwort, toothwort, trillium, geranium--and boston fern; adjacent uplands disturbed: in SE hectare, irregular canopy providing 60% coverage of maturing maple, beech, oak, and black cherry, with subcanopy of maple saplings and hawthorns in scattered clumps and groundcover of grasses and mosses in openings, or scattered stands of may-apple, geranium, and trillium elsewhere; in SW hectare, as in SE but terrain sloping into secondary ravine surrounding southern and western boundaries; in NE hectare, dense but broken canopy providing 75% coverage mostly of hawthorn (in nearly impassable thickets in many places) but also of young tulip-poplar, maple, and oak, with groundcover of seedlings of these and also at openings small sassafras, grasses, and mosses; in NW hectare, broken canopy provding 50% coverage of shagbark hickory,

maple, and overmature oaks, with subcanopy of saplings of trees, and hawthorns; scattered vines of wild grape and poison ivy and brambles of raspberry everywhere, densely in NW hectare and other open areas; also with much multiflora rose and goldenrod along gasline clearance.

Edges : S and N bounds transect woodlands described above for S and N uplands respectively; W bound from S to N lies on slope of secondary ravine, across primary ravine, and through woodlands as described for NW hectare; E bound is gas-line clearance strip 20 m wide, the other side of which is woodland like that nearby in the plot.

Census :

1.	Broad-winged Hawk	+
2.	Northern Flicker	+
3.	Red-bellied Woodpecker	2.0
4.	Hairy Woodpecker	+
5.	Downy Woodpecker	2.0
6.	Great Crested Flycatcher	+
7.	Acadian Flycatcher	2.0
8.	Eastern Wood-Pewee	1.5
9.	Blue Jay	3.5
10.	Black-capped Chickadee	3.0
11.	Tufted Titmouse	2.5
12.	White-breasted Nuthatch	1.5
13.	House Wren	0.5
14.	American Robin	1.5
15.	Wood Thrush	3.5
16.	Veery	+
17.	Blue-gray Gnatcatcher	1.0
18.	Red-eyed Vireo	5.5
19.	Blue-winged Warbler	1.5
20.	Cerulean Warbler	1.0
21.	Ovenbird	2.0
22.	Louisiana Waterthrush	1.0
23.	Hooded Warbler	2.5
24.	American Redstart	1.0
25.	Brown-headed Cowbird	+
26.	Scarlet Tanager	1.5
27.	Northern Cardinal	2.5
28.	Rufous-sided Towhee	1.5

Total Individuals 44.5

Visitors : Ruby-throated Hummingbird, American Crow, Gray Catbird, Brown Thrasher, Cedar Waxwing, Yellow-breasted Chat, Common Grackle, Purple Finch, Field Sparrow: 9 species.

Table 7B. Breeding Bird Census Information: Bottoms

Location : Summit Co. OH, 0.65 mi N of Ira Junction, intersection with Ira Road, on Riverview Road, off road 0.2 mi E; center at 41 11'27" N 81 34'42" W, in Peninsula Quadrangle, U.S.G.S. (Fig. 66a).

Size : 6.4 ha (15.8 ac), subrectangular 250 x 300 m tetralateral, but excluding 100 x 100 m of northwestern corner (Fig. 3B).

Coverage : May 26, 29, 31, June 2, 6, 13, 27, July 5, 25; each time approximately between 0730 and 1100; totaling 35 party-hours.

Description : Chiefly riverside lowland mixed deciduous forest; canopy, where present, dominated by submature mixed-age sycamore and maple with a few beechs, providing coverage better than 95%; subcanopy variable but well developed where present, consisting of ironwood and buckeye, with some dogwood, and also scattered virginia creeper and grapevine thickets; understory knotweed, tall jewelweed, poison ivy, and bee-balm; major openings in forest produced over Cuyahoga River meander with sandbars; over ox-bow-like channel flooded by overflow from expansive slough impounded by beaver dams just upstream; over gasline clearance from SW corner to channel; and over powerline clearance and small gravel borrow-pits about NE corner; cover at unflooded openings also scattered viburnum, hawthorn, sumac, chokecherry with saplings of elm, box-elder, white pines, and mature seed-producing trees and also black willow and cottonwood at riveredge, robust groundcover of multiflora rose, poison ivy, raspberry, knotweed, goldenrod, and grasses; cover at flooded openings, emergent skunk cabbage, cattail, fleur-de-lis, pickerelweed, arrowleaf, and burreed; Ohio Canal bed through eastern side carries outflow of ox-bow channel.

Edges : N bound transects fully forested area; E bound traversed irregularly by powerline clearance and river; S bound transects young forest lying along beaverpond slough further south; W bound mostly lies on crest of first terrace slope, skirting dense tall pine plantings and thickets of yards of razed residential plots; in excluded area of NW corner, buildings and mowed yards of occupied residences.

Census :

1.	Green-backed Heron	0.5
2.	Yellow-bellied Cuckoo	1.0
3.	Northern Flicker	1.0
4.	Red-bellied Woodpecker	1.5
5.	Downy Woodpecker	1.5
6.	Pileated Woodpecker	+
7.	Great Crested Flycatcher	+
8.	Eastern Wood-Pewee	1.5
9.	Blue Jay	3.5
10.	Black-capped Chickadee	2.5
11.	Tufted Titmouse	2.0
12.	White-breasted Nuthatch	1.0
13.	House Wren	3.0
14.	Gray Catbird	2.5
15.	American Robin	2.0
16.	Blue-gray Gnatcatcher	+
17.	White-eyed Vireo	+
18.	Red-eyed Vireo	3.5
19.	Blue-winged Warbler	1.5
20.	Common Yellowthroat	2.0
21.	Red-winged Blackbird	1.0
22.	Northern Oriole	1.5
23.	Brown-headed Cowbird	2.5
24.	Northern Cardinal	5.0
25.	Rose-breasted Grosbeak	1.0
26.	Indigo Bunting	3.0
27.	Rufous-sided Towhee	1.5
28.	Field Sparrow	+
29.	Song Sparrow	5.5

Total Individuals. 51.5

Visitors :

Wood Duck, Red-tailed Hawk, Ruffed Grouse, Killdeer, Spotted Sandpiper, Common Moorhen, Mourning Dove, Black-billed Cuckoo, Ruby-throated Hummingbird, Chimney Swift, Bank Swallow, Rough-winged Swallow, American Crow, Cedar Waxwing, Common Grackle, American Goldfinch: 16 species.

Table 7C. Breeding Bird Census Information: Blossom

Location : Summit Co., OH, 0.9 mi W and 0.1 mi S of West Steels Corners, intersection with Northampton Road, on Steels Corners Road, off road 0.44 mi W; center at 41 10' 40" N 81 33' 43" W, in Peninsula Quadrangle, U.S.G.S. (Fig. 66a).

Size : 5.7 ha (14.1 ac) slightly non-equilateral trapezoid 187 m wide, X 320 m along N, X 300 m along S.

Coverage : June 8, 10, 21, 30, July 12, 25; each time approximately between 0700 and 1000; totalling 18 party-hours.

Description : Evidently recently abandoned open pasture; slightly rolling crest of river valley; sloping from summit near NW corner gradually to drainage ditch traversing unit parallel to and near E bound, and to ravine incising W boundary; cover generally bluegrass and timothy, with much poison ivy, goldenrod, Queen-Anne's lace, and sedges throughout and with patches of wild raspberry, thistle, and bromegrass; scattered viburnum, hawthorn, maple, elm, choke-cherry, sumac, and apple, especially well developed at summit and in head of ravine at W edge; buttonbush and rushes in ditch, with some cattail at S end.

Edges : Field is open beyond E bound to road; N bound is fencerow of maturing trees of types listed above, with heavily overgrown stands of slightly younger trees to N beyond fence; W and S bounds mixed-age deciduous forest, moister along W bound especially near E corner where ditch drains into forestedged pond with scattered cattails and buttonbush.

Census :

1.	Eastern Kingbird	1.0
2.	Willow Flycatcher	1.0
3.	Blue Jay	1.0
4.	Black-capped Chickadee	1.0
5.	House Wren	-
6.	Gray Catbird	-
7.	American Robin	1.5
8.	Eastern Bluebird	-
9.	Cedar Waxwing	-
10.	Blue-winged Warbler	2.0
11.	Prairie Warbler	0.5
12.	Common Yellowthroat	3.0
13.	Yellow-breasted Chat	-
14.	Red-winged Blackbird	2.5
15.	Northern Oriole	-
16.	Northern Cardinal	1.0
17.	Indigo Bunting	1.0
18.	American Goldfinch	4.0
19.	Rufous-sided Towhee	1.5
20.	Field Sparrow	5.0
21.	Song Sparrow	6.0
Total Individuals		32.0

Visitors : Canada Goose, Red-tailed Hawk, Broad-winged Hawk, Chimney Swift, Mourning Dove, Northern Flicker, Barn Swallow, Brown Thrasher, Yellow Warbler, Bobolink, Common Grackle, Scarlet Tanager, Rose-breasted Grosbeak: 13 species.

Table 7D. Breeding Bird Census Information: Bishop

Location : Summit Co., OH, 0.35 mi W of intersection with Riverview Road, on Majors Road, which bounds S edge; center at 41 14' 04" N 81 33' 44" W in Peninsula Quadrangle, U.S.G.S. (Fig. 66b).

Size : 13.5 ha (34.23 ac) polygon, approximately rectangular tetralateral but with boundary excluding a triangular corner from 135 m along E bound and 22 m along N Bound.

Coverage : May 13, 24, 27, June 3, 10, 17, 26, July 2, 8, 14, 28, and August 12; each time between approximately 0730 and 1200; totalling 47 party-hours.

Description : Abandoned ornamental coniferous tree nursery on rolling broad upper slope of river valley, consisting of mosaic of tree plantation plots, service roads and alleys, and intervining fallow harvested spaces, all being overgrown by invading secondary trees, brush, and ground cover, in three longitudinal sections; the first section southernmost, a strip 500 m long, X 70 m for the W half but widening to 120 m at E bound, open rows of Scotch pine 3-5 m tall, with interspersed maple, elm, ash, hawthorn, and viburnum, and groundcover of dogwood, goldenrods, thistle, Queen-Anne's lace, and grasses, except rushes and sedges replacing this in open depressions where especially wet, sloping towards the shallow drainage depression bounding this section to N, in which are larger scattered maple, elm, hawthorn and willow, and groundcover of water willow, bracken, cattail, and rush; second section, a dog-legged strip 500- m X 75 m wide, on slope to N of first, all a plantation similar to first section of medium-aged Scotch pine 4-6 m tall, less open except at harvested patches, with similar scattered deciduous shrubs and small

trees and similar groundcover; third section, along and N beyond crest of longitudinal ridge 350 m long strip, X 75 m wide through W half but triangularly narrowing to E beyond bend in dog-leg second section, a dense plantation of overlarge Norway spruces 6-8 m tall in W half and open plantations of small Scotch pines and Norway spruces all less than 2 m tall of varied age, with grass and goldenrod groundcover; fourth section, remaining strip 500 m X 70 or 110 m wide, on slope to N, largely open grass, goldenrod, and Queen-Anne's lace groundcover with scattered plantations of stunted coniferous and deciduous ornamentals in wide rows, mostly less than 1 m tall; groundcover peppered everywhere with multiflora rose and poison ivy, in many cases overgrowing nearby woody vegetation; special features inluding several large dead-tree snags in ditch between first and second section and a large willow near apex of E third section.

Edges : To S bounded by Majors Road, with a very dense 1-2 m hedge of multiflora rose and a few sumac clumps, and across road a Scotch pine plantation; along W, a N-S service road with a large, dense plantation of large Norway spruce for the southern 50 m, then young open plantations of Scotch pine of varying age, similar to that of the first section; along N, the fencerow of a low lying abandoned pasture beyond, thickly overgrown with diverse deciduous trees and shrubs; and along E, a N-S service road, beyond which lies a conifer dense plantation overaged of large Scotch pines for the N half and an open harvested Scotch pine plantation, overgrown with grasses and forbs previously mentioned, for the S half.

Census :

1.	Mourning Dove	-
2.	Northern Flicker	-
3.	Pileated Woodpecker	-
4.	Downy Woodpecker	-
5.	Willow Flycatcher	1.5
6.	Barn Swallow	-
7.	Blue Jay	1.5
8.	Common Crow	-
9.	Black-capped Chickadee	3.0
10.	House Wren	-
11.	Gray Catbird	2.0
12.	American Robin	1.5
13.	Cedar Waxwing	-
14.	White-eyed Vireo	-
15.	Blue-winged Warbler	6.5
16.	Yellow Warbler	5.0
17.	Prairie Warbler	5.0
18.	Common Yellowthroat	4.5
19.	Yellow-breasted Chat	1.5
20.	Bobolink	3.0
21.	Red-winged Blackbird	1.0
22.	Brown-headed Cowbird	1.5
23.	Northern Cardinal	3.0
24.	Indigo Bunting	4.0
25.	Purple Finch	-
26.	American Goldfinch	8.0
27.	Rufous-sided Towhee	3.0
28.	Field Sparrow	6.5
29.	Song Sparrow	8.5
Total Individuals		70.5

Visitors : Turkey Vulture, Red-tailed Hawk, Black-billed Cuckoo, Chimney Swift, Ruby-throated Hummingbird, Purple Martin, Brown Thrasher, Warbling Vireo, Scarlet Tanager, Common Grackle, Grasshopper Sparrow: 11 species.

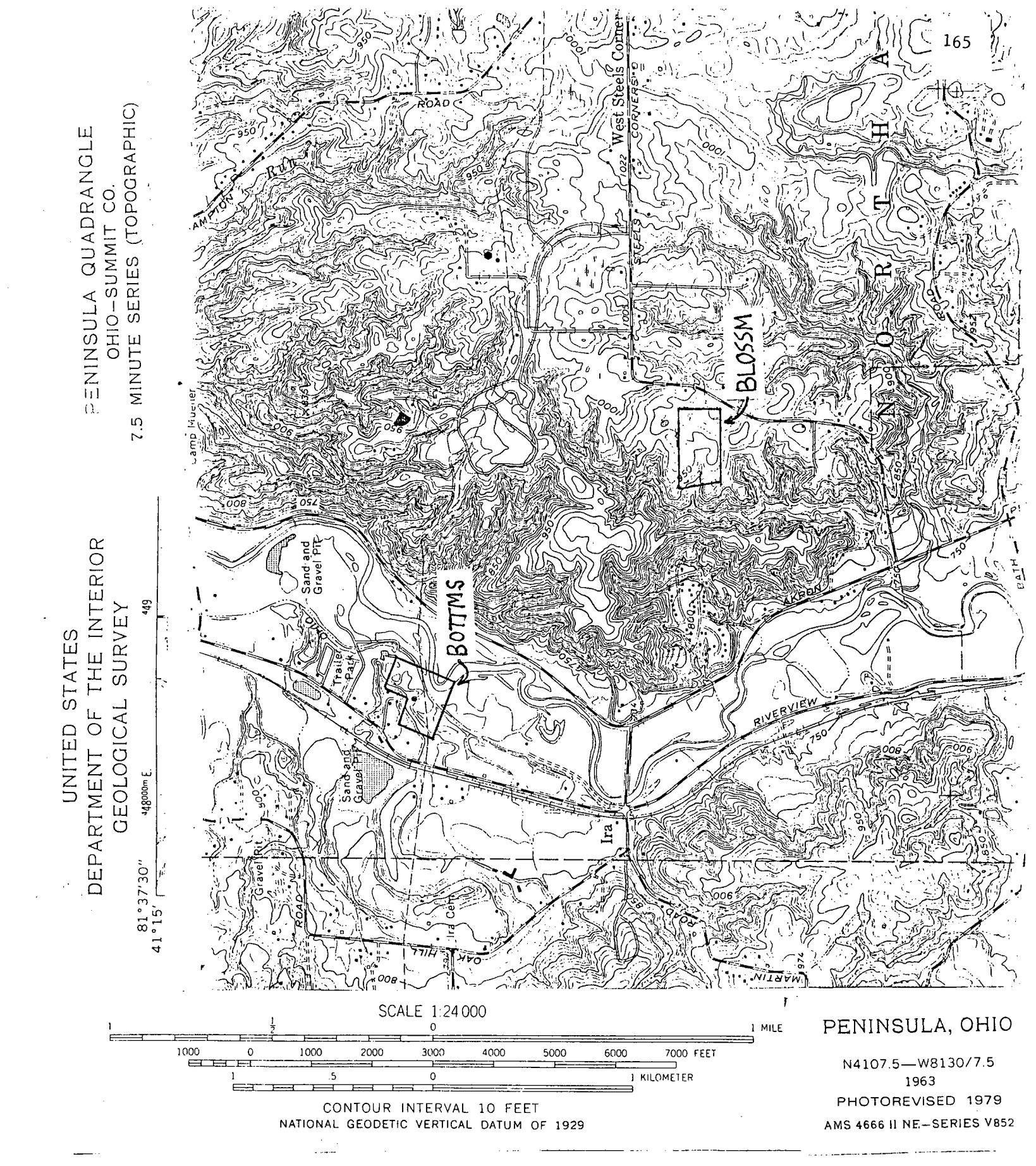


Fig. 66 A. Locations and Outlines of Bird Census Areas Bottoms and Blossom.

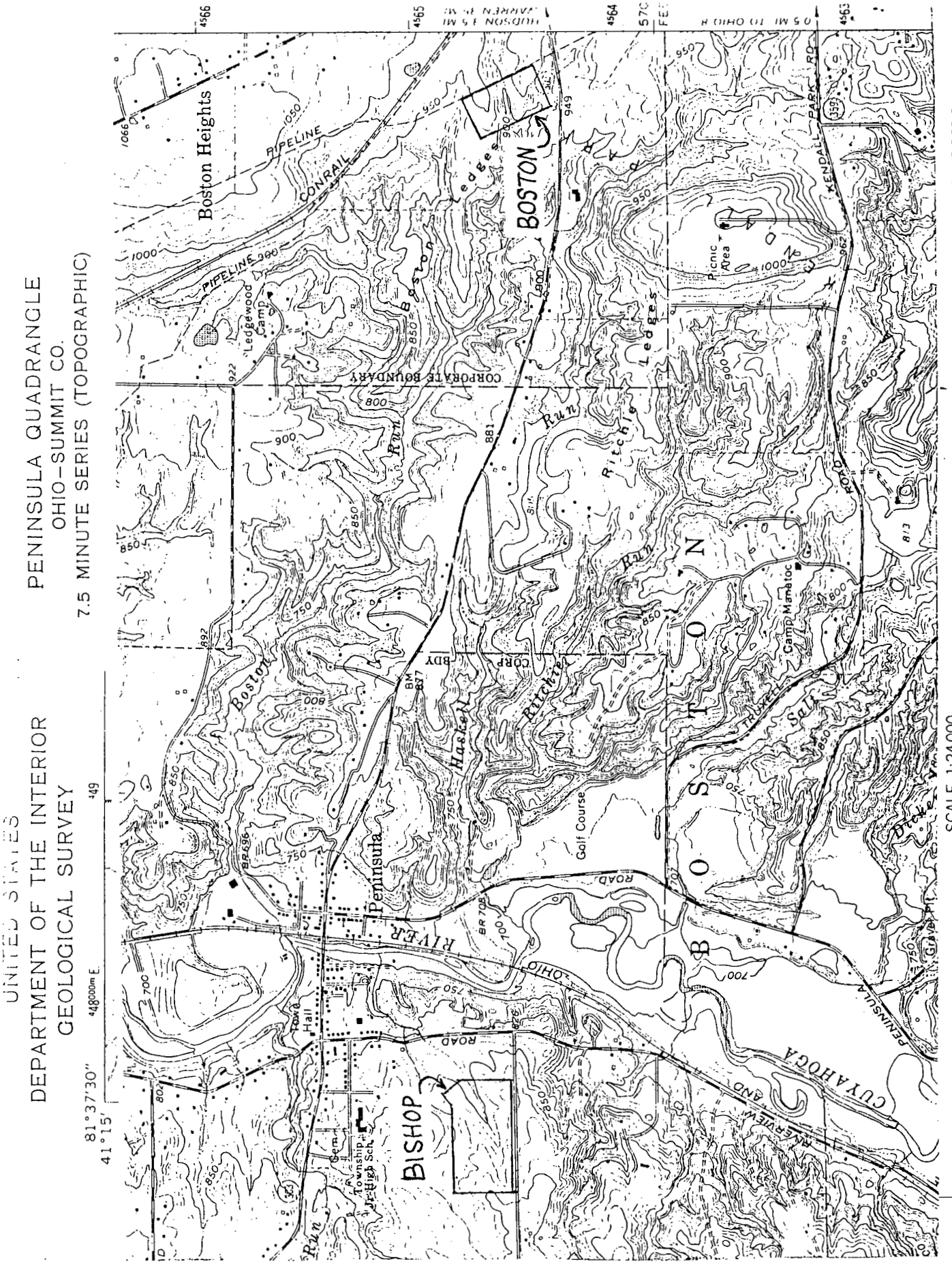


Fig. 66 B. Locations and Outlines of Bird Census Areas Boston and Bishop.

This was expressed in terms of the importance of the types of habitats available to the success of the bird. In interpreting these evaluations, it is crucial to recognize that the designations do not represent the expected abundance of the bird in each habitat but rather how significant the availability of each habitat is to the relative success of that species, within its range in general and within CVNRA in particular.

The relative significance of each habitat type at CVNRA might be represented in terms of the numbers of species to which that habitat is important (Table 8). These statistics indicate the deciduous woodlands are especially rich in dependent species; but the habitat with the greatest potential is the Wet Meadow habitat, which includes the riverbank habitats and temporarily or permanently flooded nearby lowlands.

NOTEWORTHY SPECIES Several groups of species deserve special consideration. The first of these consists of species whose occurrence in CVNRA may be considered healthy and of special interest.

Wood Duck Pairs and family groups were seen along the river and in the beaverpond marshes at 15, 16, and Bottoms. Artificial nest boxes which have been set out for this species are not abundant there, so it seems the breeding adults must be finding adequate natural cavities to use for nesting sites.

Turkey Vulture Vultures were noted during almost every

Table 8. Habitat Evaluation Summary
for 150 Summer Bird Species of CVNRA

Habitat Abbreviation	Map Numbers	All Dependent Species	Very Dependent Species
Mplsyc	1	50	14
Oabema	2,5	48	14
Oakhic	4	34	3
Wetmdw	7	54	28
Hmlkbe	3,10	33	1
Pnsprc	11	31	5
Shrbof	6	70	21
Cltsub	8,9	64	15
Brnlnd	12	14	2

daytime excursion in almost any part of the valley. Vultures are so easily seen and so reknown in northeastern Ohio that the importance of reserves such as CVNRA to this previously blue-listed species may be overlooked. The frequent association of birds in duets suggests that mated pairs may be finding enough breeding opportunities to maintain their populations in the area.

Broad-winged Hawk A territorial adult was encountered at 5, and an associated duet detected several times at 6 and Boston may have been a single breeding pair. No nest or young was seen in those areas, but an immature bird was seen at 3 in late summer 1983. The species seems very successful at CVNRA.

Spotted Sandpiper Individuals were encountered easily along the river at 2 and 15. On the basis of the numbers seen in these river areas, it may be estimated that the river from the southern extent of the park to Jaite may provide at least seven residence units for this species. Although the species was not found along any smaller tributaries that extend up into wooded ravines, larger waterways such as Furnace Run may provide habitat for three additional residence units. In CVNRA, this species is strictly associated with such riverside habitat for breeding.

Yellow-billed Cuckoo Copulation was observed between two of the birds residing at Bottoms. Yellow-bills were otherwise seen only at 2. This scarcity confirms their status as a species which was

included during the first decade of Blue-lists. The thickets of the riverside lowlands may be as close to ideal habitat as this species requires.

Belted Kingfisher This species was seen often at 2 and 15 and several individuals, presumed to be parts of a family group, were always present about the quarry lake at 18. Although this species is conspicuous, it is a bird that is never numerous and requires river and pond habitats. On the basis of typical territory sizes, (Harley, 1979), it may be estimated that there are only four breeding units on the river from the southern boundary to Jaite.

Eastern Phoebe Locally depressed populations of this species elsewhere highlight the importance of those found in CVNRA. Almost every low bridge over the river and its major larger tributaries seemed to have singing residents. Suitable nesting habitat elsewhere in the park may include ledges over ravine watercourses.

Bank Swallow The nesting colonies in the abandoned gravel-quarry embankments of 1 (Snowville Road Quarry) and 18 (Riverview Road Quarry) are evidently thriving. Holes at both sites are arranged in groupings, and only some of these sets are actively inhabited. It was estimated for this year that of the 187 potential burrows at the Riverview Road Quarry, at least 25% or 47 housed breeding birds; and of the 84 potential burrows at the Snowville Road Quarry at least 20% or 17 housed breeding birds. At 14, a third

recent abandoned quarry, embankments were extensively overgrown and certainly not in use this year by swallows. On one slope there were some cavities which may have been complete swallow burrows which were washed away or dug out.

Northern Rough-winged Swallow Duets of associated birds were seen along the river at 2 and 15 and Bottoms, near the sheer soil cutbanks, uprooted tree bases, and bridge understructures which provide the low-lying niches and burrowing sites over water required for nesting by this streamside species. Based on the numbers of birds encountered within these parts of the river, it may be estimated that there are only 5 residence units on the river from the southern boundary to Jaite. Major tributaries such as Furnace Run may provide perhaps two more residence units. None of the swallows seen at quarry sites during visits were clearly Rough-winged Swallows. But the possible presence of Rough-winged Swallows in the Bank Swallow colonies was not firmly excluded.

White-eyed Vireo Singing adults were heard in thickly overgrown flooding/poorly drained thickets at 15, Bottoms, and Bishop. According to published remarks, this species has only recently been recognized as a summer breeder in the Cleveland-Akron area. However, it is mentioned in almost every earlier account and is easily overlooked, being characteristically unwilling to come out from the dense vegetation where it forages and nests.

contaminants, hidden damage and continuing insult to the soils and biota is a possibility still under study). Also it was not found along the riversides at 2 and 15. The occurrence of the Louisiana Waterthrush, a bird evidently dependent on uncontaminated mature ravine and streambank habitats may be taken as indicator of well protected, healthy conditions within the park. It is also likely to be present along other streams of the valley which are protected, such as Ritchie, Dickerson, Langes, and Robinson Runs; Furnace Run and its tributaries; and even some of the flows such as Slipper Run, Yellow Creek, and Tinker's Creek which pass through more densely housed areas.

Hooded Warbler Singing males of this species were found on slopes of many moist wooded ravines, at 2, 3, 5, 7, 9, 20, and at Boston and Blossom. It is thriving well in CVNRA, at the northern extent of its range.

Yellow-breasted Chat This unusual species, recently removed from blue-list status, was present at several sites, all of which offered extensive shrub vegetation over low-lying wet ground. Like the Hooded Warbler, this species at CVNRA is at the northern extent of its range.

TROUBLED SPECIES Of the CVNRA summer species, 47 might be designated as troubled (Table 9). Forty-five are birds of blue-list status, in

Blue-winged Warbler This species was present wherever there was some low shrub or forest-edge habitat over poorly drained ground, although usually at sites away from the river lowlands. It was the most nearly ubiquitous warbler species observed in CVNRA.

Prairie Warbler This species was encountered at Bishop and also at Blossom. In the entire parcel on which Bishop is located, nine singing males were counted in late May. At Blossom and the adjacent field, two singing males were counted in early June. Both areas are shrubby, overgrown, abandoned farm fields, with mid-age conifers in dense stands at Bishop, but not at all at Blossom; other cover at both sites is similar.

Louisiana Waterthrush This species was present at 11, along Salt Run below the outlet of Kendall Lake, and at 6 and Boston, along Boston Run. Judging from its abundance along the upper reaches of Boston Run, it may be estimated that the full extent of the stream and its tributaries provides at least 10 residence units for this species, a considerable settlement. The species is characteristically found alongside permanent streams and larger flows through well-wooded ravines and watersheds where the water is relatively clean. The species was not encountered in ravines with lesser flow such as those near 4. Also, it was not detected at 7 along the upper reaches of Haskell Run: this was of interest because of the contamination of this watercourse in summer 1981 by residues from a tire-dump fire. (While the flowing water is no longer carrying dangerous levels of

TABLE 9. Troubled CVNRA Summer Bird Species: Recent Blue-List or Endangered/Threatened Status

*GREAT BLUE HERON
*GREEN-BACKED HERON
Black-crowned Night-Heron
LEAST BITTERN
*AMERICAN BITTERN
AMERICAN BLACK DUCK
*TURKEY VULTURE
SHARP-SHINNED HAWK
COOPER'S HAWK
*RED-SHOULDERED HAWK
Bald Eagle
Northern Harrier
*Osprey
*AMERICAN KESTREL
*Wild Turkey
*NORTHERN BOBWHITE
*KING RAIL
Upland Sandpiper
Black Tern
*YELLOW-BILLED CUCKOO
*BLACK-BILLED CUCKOO
COMMON BARN-OWL
EASTERN SCREECH-OWL
Long-eared Owl
Whip-poor-will
COMMON NIGHTHAWK
*RUBY-THROATED HUMMINGBIRD
*RED-HEADED WOODPECKER
*HAIRY WOODPECKER
*EASTERN PHOEBE
*WILLOW FLYCATCHER
*LEAST FLYCATCHER
*PURPLE MARTIN
Sedge Wren
*HOUSE WREN
Carolina Wren
*EASTERN BLUEBIRD
Loggerhead Shrike
*WARBLING VIREO
Golden-winged Warbler
*YELLOW WARBLER
*COMMON YELLOWTHROAT
*YELLOW-BREASTED CHAT
*EASTERN MEADOWLARK
*GRASSHOPPER SPARROW
HENSLOW'S SPARROW
Vesper Sparrow

*encountered in the present study.

that they have been on the list at least one year since the first (Tate, 1981,: Tate and Tate, 1982). Two more species are recovering species--Bald Eagle (Smith et al., 1973) and Wild Turkey. For the entire 47, 33 are regular summer species at CVNRA; 25 of these 33 regulars were encountered in this project.

The current Blue List (Tate and Tate, 1982) is much more specific than earlier lists: it includes only 18 CVNRA summer species. The annotations below concern the 12 of these which are regular at CVNRA.

Least Bittern This species was not encountered during this study; unless repeated searching is pursued, this elusive bird escapes notice. It was seen in comparable marsh habitat in the Cuyahoga River watershed, at Tinker's Creek State Park in late spring 1983.

American Bittern This species was seen once flying over riverside fields near 14. It was seen similarly in flight over areas east of CVNRA twice. All sightings were in late spring 1983.

Sharp-shinned Hawk This species was not encountered during this study, but a pair nested near Kendall Lake in 1978 (Sturtevandt, 1979). The dense plantations of tall conifers around Kendall Lake and elsewhere are likely to be the habitat feature attractive to this species.

Red-shouldered Hawk This species was seen three times: in the first two instances, soaring over areas north of 6; in the third,

flying over Bishop. Although appropriate habitats seem to be available, this hawk was definitely not as conspicuous as Red-tailed and Broad-winged Hawks.

King Rail A downy chick of this species was encountered and examined (by L.P.O.) at the marshy overflow by the Kendall Lake Entrance. While this is certainly an encouraging record, the status of this species in CVNRA is still uncertain. In addition to this site, the only other suitable habitats are the treeless sloughs in the riverside lowlands, from which it has not previously been reported.

Ruby-throated Hummingbird This species was encountered as readily as would be expected in appropriate habitat at 4, 13, and 18, and at all four census sites. Its blue-list status pertains to declining populations in northeastern states.

Hairy Woodpecker This species was encountered as readily as would be expected in appropriate habitat at 2, 9, 10 and 11. The apparently healthy status of this species in the park contrasts with its distinct scarcity elsewhere.

Willow Flycatcher This species was encountered as readily as would be expected in appropriate habitats at 2, 15, 16, 17, and Bishop. Its blue-list status pertains to declining populations in the western parts of its range.

Eastern Bluebird Three separate pairs of adults, associated with juveniles which were still being fed by the adults, were encountered at 11, 17, and Blossom. This much-publicized favorite has been benefitting from the attention and help directed to it throughout its range.

Yellow Warbler Singing males and attendant females were present at 2, 15, 16, Bishop, and Blossom. Its blue-list status pertains to scarcity in the far-west parts of its range.

Eastern Meadowlark Individuals were present at roadsides near 6 and 14, but the species was not as widespread as might be expected. It was absent from Blossom where it could have been expected to nest.

Grasshopper Sparrow A single individual was encountered at Bishop as a visitor. However, considering the habitat and the quietness of this species, it may have been a breeder there. It was absent from Blossom where it could have been expected to nest.

Extirpated Species

With the settlement of northeastern Ohio, a number of species disappeared primarily between 1800-1850 from the area now occupied by the CVNRA. These extirpated species and their habitats are given in Table 7. The alteration of the environment that followed settlement included clearing of the land for agricultural purposes, which

TABLE 10. Species which probably occupied the Cuyahoga Valley at one time but are now extirpated. Breeding habitats are underlined and preferred habitats are indicated with an asterisk (*). Numbers in parentheses identify habitats on an existing CVNRA Vegetation Study Map.

SPECIES	Maple-Sycamore Forest (1)	Oak-Beech-Maple Forest (2+5)	Hemlock-Beech Forest (3)	Oak-Hickory Forest (4)	Scrub-Oldfield (6)	Wet Meadow (7)	Cultivated-Suburban Land (8+9)	Barren Land (12)	Pine-Spruce Forest (11)	Swamp	Ponds and Lakes	Stream-Stream Edge
Snowshoe Rabbit		x	x		x				x*	x		
Black Rat							x*					
Gray Wolf	x	x	x	x					x*			
Marten	x	x	x	x					x*			
Fisher	x	x	x	x					x*	x		
Mountain Lion	x*	x*	x*	x*					x*	x		
Lynx	x	x	x	x					x*			
Bobcat	x*	x*	x*	x*					x*			
Coyote	x	x	x	x	x*		x		x			
River Otter											x	x*
Black Bear	x*	x*	x*	x*		x			x*			x

TABLE 10. (Continued). Species which probably occupied the Cuyahoga Valley.

SPECIES	Maple-Sycamore Forest (1)	Oak-Beech-Maple Forest (2+5)	Hemlock-Beech Forest (3)	Oak-Hickory Forest (4)	Scrub-Oldfield (6)	Wet Meadow (7)	Cultivated-Suburban Land (8+9)	Barren Land (12)	Pine-Spruce Forest (11)	Swamp	Ponds and Lakes	Stream-Stream Edge
Porcupine	x	x	x*	x					x*			
Elk (Wapiti)	x	x	x	x		x*			x			
Bison					x	x*						
Common Merganser	x*					x*				x	x	x
Peregrine Falcon	x*	x	x	x	x	x		x*	x	x	x	x
Merlin	x*		x			x*			x		x	x
Greater Prairie-Chicken					x*	x		x				
Common Raven	x*	x	x	x	x	x	x	x*	x			

undoubtedly caused many herbivorous species dependent upon the forests for food to decline in population size. The species most severely affected, however, by this environmental alteration would be top level carnivores because of their dependence upon large herbivore populatins lower in the food chain for subsistence.

Large species with large home ranges because of their energy demands on the environment would also be expected on the list of extirpated species. It is interesting that no small ectothermic animals (amphibians and reptiles) are on this list, not only because of their lower energy demands but also because of their secretive nature.

Hunting of large carnivores and herbivores by early settlers for both food and sport undoubtedly was another significant factor in the disappearance of such species as Elk, Black Bears, and Mountain Lions from the Cuyahoga Valley. Finally, early settlers brought with them certain undesirable species such as the Norway Rat and House Mouse which were thrown into competition with native species. The Black Rat, less aggressive and smaller than the Norway Rat, probably disappeared from the Valley as it has from most of its original range because it could not compete with the Norway Rat.

It is encouraging that several species once on the Cuyahoga Valley's list of extirpated species are once more residents of the Valley. These species include the Beaver, White-tailed Deer, Canada Goose,and possibly the Turkey. A major question now facing resource management personnel of the CVNRA is whether other extirpated species should be returned to this portion of their original range.

DISCUSSION

Amphibians and Reptiles

As additional field work is conducted in the CVNRA, we feel that few additional amphibian or reptile species will be added to our current inventory of 19 amphibian and 17 reptile species; i.e. virtually all of the herpetiles we would expect to be in the Park have now been reported. Unreported amphibians which would have the highest probability of being found within Park boundaries would include the Four-toed Salamander, an endangered species commonly associated with sphagnum bogs. Although there are no bogs in the CVNRA, this species is sometimes found under rocks and logs on the floor of mature woodlands. The Marbled, Silvery, and Small-mouthed Salamanders, all extremely rare in this area, could possibly breed in the temporary ponds of the Park similar to those described earlier for the Jefferson's and Spotted Salamanders. Finally, the Park has suitable pond, lake, and stream habitats for the Mudpuppy, a rare species we have not collected in northeastern Ohio during the past 25 years although it has been reported during this time.

Of reptiles which could be added to the inventory with additional collecting, the Spiny Softshell Turtle, an inhabitant of rivers and large streams, would be most likely. Once the Cuyahoga River is cleaned up in the Park, it is highly likely that this turtle will return to the CVNRA. Bert Szabo, a naturalist for Akron Metropolitan

Parks, has reported to us that he has seen Fence Lizards at Deep Lock Quarry Park (Orr, 1978). We have visited this Park which is within the boundaries of the CVNRA on numerous occasions and have been unable to observe the species. If Fence Lizards are in the CVNRA, we would suspect that they have been released there since the closest natural populations are from Holmes and Jefferson Counties (Conant, 1951). Although Five-lined Skinks have been reported from Brecksville Reservation at the northern end of the Park, the species has not been reported within existing boundaries of the CVNRA although small, localized populations could exist within the Park.

Of the significant questions raised by this survey which relate to the amphibians or reptiles of the Park, we feel the most interesting concerns the status of the Leopard Frogs, Red-eared Sliders, and Eastern Box Turtles in the CVNRA. As mentioned earlier, we were surprised that we were unable to locate Leopard Frogs in the Park and based our listing of this species on the herpetile inventory on a single individual collected by Jack McCormick Associates (1975). This animal was not available to us for verification of its identification so we do not know if they misidentified a Pickerel Frog as a Leopard Frog. In speaking with naturalists Bert Szabo, Carl Smith, and John Kason from the Akron and Cleveland Metropolitan Parks in the fall of 1983, only one could recall seeing or hearing a Leopard Frog within recent years. This animal was from Lake Isaac in Cuyahoga County. Thus our concern is whether this species is actually declining in numbers or whether it has always been in low frequencies in the Park. Because amphibians are excellent biological indicators

of acid rain, the more quantitative data we have available now on amphibian populations in the Park, the better prepared we will be to monitor the effects of such environmental perturbations as acid rain in the future.

We feel the Red-eared Slider and Eastern Box Turtle populations also warrant additional study to determine if they are established breeding populations or whether the individuals we have collected or observed were simply released in the area. This could be easily decided by determining the reproductive condition of adult females and by searching for large numbers of basking adult Red-eared Sliders.

Mammals

The inventory of 31 species of mammals that we have documented in this survey for the CVNRA compares favorably with the list of 31 species Gottschang (1981) has recorded from Summit County which includes most of the CVNRA. Gottschang recorded three species from Summit County which we did not find, the Least Shrew (Cryptotis parva), the Red Bat (Lasiurus borealis) and the Southern Bog Lemming (Synaptomys cooperi), while we recorded five species from the CVNRA which he had not recorded for Summit County. The latter species include the Eastern Mole, the Fox Squirrel, the Red Fox, the Gray Fox, and the Mink. This discrepancy in lists, however, is not necessarily meaningful because species such as the Red Fox are often not reported in the literature or represented in museums for certain counties even though the species is common in that county.

As mentioned earlier Gottschang's range maps indicate that as many as 45 mammal species could be in the Park while Burt (1957) indicates 43 and Hamilton and Whitaker (1979) indicate 42 species. Intensive collecting efforts on the bat populations in the Park probably would add such species as Keens Myotis (Myotis keenii), the Silver-haired Bat (Lasionycteris noctivigans), the Hoary Bat (Lasiurus cinereus) and possibly the Eastern Pipistrelle (Pipistrellus subflavus). Although we spent hundreds of trap nights in attempting to locate the Pine Vole (Microtus pinetorum), the Southern Bog Lemming (Synaptomys cooperi), and the Deer Mouse (Peromyscus maniculatus), we were unable to locate populations of these species. Eventually they may be reported. The fact that the populations of these species are commonly cyclic and may be found in small, restricted habitats often causes them to be overlooked.

Another species which undoubtedly will be reported in the future in the CVNRA is the Coyote (Canis latrans). The range of this canid is expanding eastward rapidly. Trapping records kept by the Ohio Division of Wildlife indicate a steady increase of this species in Ohio. In the 1980/81 season when coyote records were begun, 28 pelts were taken, in the 1981/82 season, 56 pelts were taken and during the 1982/83 season, 143 pelts were brought in by Ohio State Trappers. This indicates that the Ohio population of coyote is probably increasing rapidly, with more than double the number of pelts each year since 1980. A recent roadkill in Cuyahoga Co., plus seven coyotes seen or killed in Portage Co. and a recent sighting of coyote in Medina Co. (Ohio Division of Wildlife records) indicate that the

eastern coyote is in the immediate vicinity of the Cuyahoga Valley National Recreation Area already. The large amount of brushy, shrub/seral oldfield and forest edge plant communities developing at the CVNRA as a result of farm abandonment, represents prime coyote habitat which these animals will certainly move into in the near future. Coyotes in our area tend to feed primarily on small mammals and carrion and as such will probably not represent a significant threat to the resident deer herd unless the number of deer increase in number. However we do anticipate an increase in the CVNRA deer herd to occur over the next few years, an increase which may increase the importance of coyote as a predator. Certainly such studies by Beasom (1974) or by Kie et al. (1979) in Texas indicate that significant control of deer populaion levels can be, at times, attributed to coyote predation. It is also interesting to note that in the study by Kie et al. (1979) the overall general health of the deer was better and the level of parasites in the deer was lower when coyotes were present, than in the control group where coyotes were removed.

Such public health problems as rabies or the tapeworm Echinococcus granulosus , will probably not be significantly impacted by the arrival of coyote to the Park; however the level of tapeworm infection levels in susceptable herbivore populations might be examined at a later date.

At the present time we would expect some competition and possibly a reduction in fox, especially red fox, population levels on the arrival of coyote in the Valley with the possibility also of refuse feeding in picnic areas, area villages etc. as additional low

probability impacts. The overall effect however will probably remain minimal within the Park area.

Birds

REPORTED BIRD SPECIES POPULATIONS The question of whether or not species listed for CVNRA on the basis of literature should be expected even though they weren't encountered during this study might be addressed by comparing rates of encounter of species with other studies of species encounter rates. In these studies, the populations of birds residing in an area were implied or known through independent study, so that for a census technique used (usually a moderately intensive transect), a rate of species encounter could be determined. In general, these studies (Palmgren, 1930; Kendeigh, 1944; Bond, 1957) report rates of about 73%.

In the present study, the rate of cumulative encounter of all listed species was 70%, about the same as 73%. The rate for listed regular species was 90%, much higher than 73%. Of the eleven regulars not seen, seven were crepuscular (i.e. twilight)--patently difficult to encounter without special efforts not extended in this study. The remaining four species were elusive aquatic species (such as Least Bittern) and species of marginally regular status (such as American Black Duck). In general, these results support the validity of the CVNRA summer bird species list prepared for this study.

The value of the results of the standardized intensive censuses lies in providing a quantitative basis for any comparisons of data.

For example, these data might be compared with reports of N.A.S. Breeding Bird Censuses for similar areas. From those compiled last year (Van Velzen and Van Velzen, 1983) one might compare Boston with the unit censused by Ickes (1983); Bottoms with the units censused by Snyder (1983); Blossom with the units censused by Gross (1983); and Bishop with the unit censused by Brooks (1983). In each case, the more abundant species of both rosters were the same. The units also showed comparable overall species richness, when differences in total area size are considered. The abundant species also occurred with densities within normal ranges (Stokes, 1979). In general, these results support the value of the intensive survey units as a basis for comparison in the future.

HABITATS AND BIRDS Considering the potential occurrence of bird species with respect to habitats in CVNRA, there were three groups meriting special concern. One was the group of various forested habitats which might be considered characteristic of the area--lowland and upland woods, ravine woods and hemlock stands; also, conifer plantations. These comprise residence for fully one-third of all CVNRA species.

A second habitat of concern was the single type called "wet-meadow"--areas within and immediately surrounding flooded terrain. One-third of all CVNRA species depend on this habitat, and more than half of these are highly dependent--that is, if the wetland habitats of CVNRA were destroyed, these species would disappear, too.

A third habitat of concern involved the special types created by

disturbances--shrub-oldfield and cultivated-suburban areas. Almost half of all bird species depend on such habitats, and about one-third of these are highly dependent. The wetland and disturbance habitats together do not share many species in common; thus, a third of all CVNRA species are highly dependent on these last two habitats together.

NOTEWORTHY BIRDS Additional comments on the significance of these CVNRA habitats may be reviewed in terms of noteworthy regular species found in each. Species of the forested areas included just three troubled species--Red-shouldered Hawk, Sharp-shinned Hawk, and Hairy Woodpecker. The statuses of the two hawks were not any more certain for CVNRA than anywhere nearby and were apparently not reassuring for their presence in the future. This may be due to the interrupted and less mature condition of the upland forest sites. The occurrence of the Hairy Woodpecker was substantial and, together with the successful populations of Broad-winged Hawk, Hooded Warbler, and Louisiana Waterthrush in the woodland ravines, indicated these particularly unique habitats are in good condition at present.

Troubled regular species of the wetland habitats were more numerous--Great Blue Heron, Green-backed Heron, Least Bittern, American Bittern, American Black Duck, King Rail, Yellow-billed Cuckoo, Eastern Phoebe, Willow Flycatcher, Yellow Warbler, Common Yellowthroat, and Yellow-breasted Chat. Most of these were present in numbers which were not low for what one might expect for the region. This generalization is meant to apply even to the Least Bittern and

King Rail, for which really suitable habitats in CVNRA are rather restricted. The successful populations of Wood Duck, Spotted Sandpiper, Belted Kingfisher, Rough-winged Swallow, and White-eyed Vireo also indicate that the wetland habitats, especially at riverside, are not in a disastrous state, despite the pollution stresses which the river suffers (Jack McCromick and Associates, Inc. 1974).

The status of species of disturbed habitats is much harder to assess. Aboriginally, the entire region within which the CVNRA lies was covered probably continuously with elements of the eastern North American deciduous forest biome. So it was only through fires, floods, landslides, severe windstorms, and primitive human activities that any extensive disturbed habitats for such species arose. These naturally disturbed areas also tended to undergo succession leading to re-establishment, over a predictable period of time and after a predictable series of stages, of the forested condition.

It is assumed that modern settlement has enormously enlarged the extent of such areas of disturbance and has, through the intensity of disturbance and the introduction of unusual plants and animals, slowed and diverted succession. Disturbed-habitat species today are confronted with modern disturbance patterns that take away natural causes of disturbance--such as fire--and add new ones--such as cultivation and mowing of cleared areas. Available information on aboriginal condition is imperfect in unknowable ways. Thus, defining "normal" presence for a species of bird found in modern disturbed sites is speculative.

Troubled regular species that are dependent on disturbed sites especially are Cooper's Hawk, American Kestrel, Northern Bobwhite, Black-billed Cuckoo, Common Barn-Owl, Eastern Screech-Owl, Common Nighthawk, Ruby-throated Hummingbird, Red-headed Woodpecker, Least Flycatcher, Purple Martin, Eastern Bluebird, House Wren, Warbling Vireo, Eastern Meadowlark, Grasshopper Sparrow, and Henslow's Sparrow. Of these, only the occurrence of Eastern Bluebird might be evaluated as encouraging. While the species has in CVNRA many grassy mowed or fallow fields for foraging, it is normally at a disadvantage unless artificial nesting cavities are provided. In part, this is due to cleanup removal of rotting snags and fence-posts near grassy clearings, and in part, it is due to competition for nest cavities from European Starling and House Sparrow. In any event, having the species at CVNRA is meritorious.

The special problems of evaluating species in disturbed habitats might be exemplified by a noteworthy species population at CVNRA, the Bank Swallow. This species requires for colonial nesting relatively high, sheer expanses of exposed sandy soilbank. The colonies at CVNRA (as almost everywhere in the eastern USA) are located at large abandoned gravel borrow pits. When erosion degrades these sites, the swallows will need newly created banks elsewhere, most likely at another gravel pit. Otherwise, new habitat would come about naturally by massive landslides of deep sediments along the river, both created by flood processes. But since the floods are now controlled, both sedimentation and landslide events are prevented. The species can persist here only through artificial disburances created by the same

humans who control the natural disturbances necessary for the species.

Modern disturbance patterns have produced changes in range of birds, and many of the CVNRA birds of disturbed areas (for examples, Eastern Meadowlark, Brown-headed Cowbird) are savannah or prairie species with ranges centered further west. Their occurrence in northeastern Ohio certainly has benefitted from clearing of forests and in some cases may be unrecorded but recent "range extensions" (Aldrich 1934).

This calls attention to two noteworthy species at CVNRA--the Blue-winged Warbler and the Prairie Warbler. A recent history of the Blue-winged Warbler has been pieced together by Gill (1980). This species may have been present in northeastern Ohio before modern settlement, confined to brushy forest edges near flooded ground. However, its current more prominent status in the eastern Great Lakes has been traced back to a wave that started in areas further to the southeast and southwest, closer to the center of the species' range. This "invasion" or "surge" may have been caused by some long-term regional climatic changes, but it seems likely that it involved the disturbances of modern settlement (especially development near pastures, orchards, and croplands of the denser, shrubby growth this species prefers, or perhaps disturbance-caused declines in populations of competing species). It may also involve changes of this species' tolerance of drier sites and of extensive stands of low growth. In any event, it seems that the current vigorous populations of Blue-winged Warblers are of historically recent origin in northeastern Ohio, dating back to about 1920.

In some areas, one outcome of this change in Blue-winged Warbler population has been declines in populations of the closely related Golden-winged Warbler. These declines have been attributed to competitive exclusion, or to genetic swamping of the Golden-wing with which the Blue-wing successfully hybridizes, or both. (Hybrids have been observed in the vicinity of CVNRA.) The success of the Blue-wing may be the factor undermining the Golden-wing at CVNRA.

The occurrence of nesting Prairie Warblers at the Bishop parcel (Hannikman 1981) is clearly known to have come about only in the last decade, perhaps only as recently as 1980 when published reports indicate the colony was first discovered (Tveekrem 1980, 1982).

Both Prairie Warbler and Chesnut-sided Warbler are associated with burned areas or other cleared sites during the pre-canopy stages of woody growth typically disturbed upland vegetation, brush and moderate-sized saplings on drained or dry sites (Kendeigh 1945, Johnston and Odum 1956, James 1971, Shugart and James 1973, Connor and Adkisson 1975, Webb et alii 1977, Anderson 1979, Dirkson and Segelquist 1979, Strelke and Dirkson 1980, Maurer et alii 1981). In the case of the Prairie Warbler, this typically begins as early as the third year after clearing and lasts until the woody growth matures and closes over the site, as early as the fifteenth year after clearing. Usually present in Prairie Warbler habitats are scattered but numerous young needle-leafed trees (pines, spruces) and also thorny shrubs.

The center of the Prairie Warbler range lies within the hardwood/coniferous forests of the southeastern USA, while the Chestnut-sided range centers to the mixed forests of northeastern USA.

While the Prairie Warbler is a distinctly southern bird, the northern boundary of the breeding range is problematical. It has previously been reported to lie south of northeastern Ohio and western Pennsylvania and the southern St. Lawrence watershed. Recent increase and "invasion" of sites in Pennsylvania and New York have been associated with increases in ornamental conifer nurseries--"Christmas tree farms" (Harrison, 1979; Nolan, 1978). The occurrence of Prairie Warbler in northeastern Ohio and CVNRA may have a similar basis; in fact, the Bishop parcel is such a habitat. This is an unusual stand of vegetation for this area, where succession on burns and clearings does not typically involve conifers.

However, breeding Prairie Warblers have been found regularly at numerous sites in southern Ontario and in the lower peninsula of Michigan. Those areas are generally recognized as a part of the normal range of the species. Prairie Warblers have resided at a central New York state site--an active Christmas tree farm--off and on for the last decade (Brooks, 1975, 1978, 1982, 1983) and possibly longer.

The status of the Prairie Warbler in these areas is confounded by the temporary occupancy that any mid-succession species must exhibit, by definition. Such species presumably persist by colonizing newly developing disturbed sites elsewhere, perhaps at a surprising distance from a maturing site which the birds are abandoning. The Prairie Warbler at CVNRA may be demonstrating its ability to use a breeding-residence opportunity that has arisen by human disturbance in a region that it would otherwise pass over. Unless a new race

compatible with other types of disturbance habitats is evolving, the CVNRA population will need new clearings planted with some conifers to persist. It will be of interest to record the progress of events with respect to the species at CVNRA.

BIRDS OF SPECIAL ECOLOGICAL STATUS The occurrence of each regular species of bird can be indicative of the health of habitats in CVNRA. Also, when a regular species is reduced or extirpated, management efforts will more surely restore conditions that can encourage the species. For these reasons, this report has focused attention on regular species and not on species of less certain status.

Some irregular or extirpated species mentioned in the results are of special interest primarily because of the striking features and historical significance each has: Osprey; Bald Eagle; Peregrine Falcon; Wild Turkey; Greater Prairie Chicken. The current status of each involves modern ecological problems and management practices that have received widespread discussion in popular publications. All are birds which have undergone drastic declines in numbers either throughout the entire range of the species or within the eastern USA. And all have responded in some way to diverse efforts to re-establish the species. The prospects of the species with respect to CVNRA are discussed below.

Osprey This unique fish-eating raptor is currently recovering from declines in the eastern USA, mostly caused by the toxic chemical pollution, DDT in particular. Ospreys have recovered tenuously and

have been seen passing through CVNRA from time to time, including the period of this study.

Considering the water quality problems of the Cuyahoga River, it seems unlikely that the river could at present provide adequate food source for more than a transient Osprey. Observations have not established that the species successfully forages in the Cuyahoga River at all. However, reservoirs and lakes in and near the watershed are likely to have the quality of fish which this species needs to support itself over a period of time.

Historically, Ospreys bred successfully along the shore of Lake Erie and probably also up into the lower Cuyahoga River valley. In addition to the food supplies there, these areas before settlement provided the large dead trees in which the species usually builds nests. However, it is not certain that the Cuyahoga River as far upstream as the CVNRA ever had adequate volume needed to support breeding Ospreys.

If Ospreys do take breeding residence, it will most likely first be at one of the reservoirs or lakes of the valley. From such a site, the birds may range into CVNRA while foraging. Otherwise, the bird might continue to be expected in CVNRA only as a migrant or non-breeding transient.

Bald Eagle This well-recognized shoreside scavenger and raptor, an associate of the Osprey, has also declined, nearly to the point of extirpation in the northeastern USA. Again the most recent and most critical factor has been toxic chemical pollution, although

in the case of this species, breeding habitat destruction has also been a major factor, both through clearing of traditional nest-trees and through disruption of the nesting pairs of this anxious species. Through protection and isolation of remaining nest sites and reduction of pesticide use, the Bald Eagle has been recovering (Holden 1982). However, this recovery is not as reassuring as in the case of the Osprey, so more elaborate manipulation, involving various systems of propagating and delivering more eaglets to nests of existing sterile pairs, have been applied recently. The long-term results of these steps remain to be seen. Meanwhile, Bald Eagles are seen passing through CVNRA from time to time.

Considering the water quality problems of the Cuyahoga River, it seems unlikely that the river could at present provide adequate food for more than a transient eagle. Observations have not established that the species forages successfully in the Cuyahoga River at all. However, reservoirs and lakes in and near the watershed are likely to provide the quality of fish and other prey which this species requires.

Historically, Bald Eagles bred successfully along the shore of Lake Erie. It is not certain that the Cuyahoga River ever supported breeding eagles away from the lake. In northeastern Ohio there is just one site where breeding eagles have recently occurred, but not in the Cuyahoga watershed (VanCamp 1980, 1982). Hopefully, recovery of the population will lead to more breeding pairs.

If Bald Eagles do take breeding residence, it will most likely be at one of the reservoirs or lakes of the Cuyahoga River valley. A

breeding pair was reported just 30 years ago at Lake Rockwell (Williams 1950, Dexter 1955). From such a location, the species might range into CVNRA regularly in foraging. Otherwise, the bird might continue to be expected only as a non-breeding transient or a migrant in CVNRA.

Peregrine Falcon This is another raptorial bird of the shores of large water bodies. While it may forage widely, its nesting habitat--rocky cliff ledges--restricts the distribution of breeding pairs much more so than Osprey or Bald Eagle. Peregrines have been the type-species for the declines caused by DDT, and this pesticide may have been the sole factor which virtually wiped out the populations in the contiguous USA in the few decades before 1970. Unhelped Peregrines have recovered very little. The species' inclination to feed on birds, especially shorebirds and ducks, has kept it under the influence of chemical pesticides brought back from Latin America in these migratory prey. Recovery has been helped most by release in suitable habitats of birds carefully propagated in captivity (Cade 1974, Cade and Temple 1977). These have become established as breeders not only in some typical wilderness but also in metropolitan areas where food and cliffs are provided by commensal birds (Rock Doves, Euopean Starlings, House Sparrows) and tall buildings.

The Peregrine Falcon was evidently always unusual in northeastern Ohio, even along the lake shore, and it does not seem that natural sites anywhere within CVNRA ever could be satisfactory for breeding

residents. No peregrines have been recently recorded at CVNRA even as visitors.

Establishment of the Peregrine Falcon as a breeding resident in CVNRA is very unlikely without drastic habitat modification and costly intervention. City peregrines have not yet been introduced to Cleveland or Akron, but this approach has some merit. The suitability of existing architectural sites--large bridges or buildings--adjacent to CVNRA is uncertain. CVNRA might expect only to provide an important foraging ground for temporary residents, migrants, and for possible breeding residents headquartered elsewhere, as the Peregrine Falcon population increases.

Wild Turkey Evidently through overhunting but also through habitat destruction, Wild Turkeys were extirpated during the 1800's and early 1900's from most of the eastern USA. As woodlands have recovered and with limitation of hunting, the species has been successfully re-introduced throughout most of its former range. The species requires upland forests interrupted by some areas of more open, successional stages. Turkeys were introduced into CVNRA some years ago; if the current birds are descendants of the originally released, the birds are evidently maintaining some numbers. It seems likely that a population could persist. However, nesting has not been verified and the present birds could be the result of unreported reintroductions.

Greater Prairie Chicken As was the Wild Turkey, this species

was extirpated from the eastern USA through habitat destruction and overhunting; it should be noted, however, that available habitat on and near the Appalachian plateau must have been very unusual, for the bird is not a forest species. Historically, it may have occurred at locales along the Lake Erie shore but probably was never a regular breeding resident of CVNRA. While clearing of sites and maintenance of grassy vegetation creates habitats favorable to this species, it needs extensive tracts of such habitat. This species is not a candidate for achieving status as a CVNRA regular species in the future.

RECOMMENDATIONS

In making recommendations about CVNRA wildlife management problems, we necessarily imply an attitude about the level of intervention we believe CVNRA should pursue. The attitude adopted might be characterized as favoring thoughtfully directed compromises between extensive manipulation and a totally restrained protection. While the public might be inclined to pursue a barrage of species-by-species propagation programs ("farming") projects, this extreme is unfeasible, controversial, and unaesthetic. Rigidly banning any intervention favoring wildlife can be equally unfeasible and also inconsistent with existing manipulations and with the multipurpose mission at CVNRA. That is, fire, flood, pollution, and other disturbances are already being restrained; and recreational sites, historical sites, educational sites, protected sites and access/boundary regions already involve modifications and maintenance. Dealing with these several factors which call upon CVNRA to intervene in wildlife conditions and at the same time preserving the flora and fauna of the river valley in a natural state will obviously call for compromises on a problem-by-problem basis.

Specific Recommendations

1. A system of land-use compartmentalization should be established which identifies, in terms of visitor utilization and wildlife

utilization, the ultimate destiny of parcels which make up CVNRA. The objective of this system would be to set up in-house zoning by which development of programs and deployment of resources can be planned and described. With such a system, the progress in approaching goals and the impact of changes imposed by outside factors can be figured, and needs for compensatory re-zoning or for management activities can be identified. Such a system can also help organize future research activities.

2. The land area of CVNRA, in common with most of the state parks in Ohio, suffers from fragmentation--the division of land areas by villages, major highways, secondary roads, railroad and other right-of-ways, and even the river, segmenting otherwise contiguous plant communities into small blocks. These may in some cases be too small to support some of our more interesting species of wildlife (Robbins, 1979). The compartmental system of land-use designation should take this into consideration in trying to set aside one sector or more, including some ravines and their adjacent woodlands, for preservation in a near "wilderness" state, with special effort to control any further fragmentation of these areas by interrupting features and to reverse fragmentation that has already taken place.

3. Programs of moderate actions which fall within Park Service policy and enhance wildlife utilization of existing disturbed areas--mowed picnic parks, perimeters of cultivated land, sites with heavy human traffic, plantations and orchards, and utility right-of-ways-should be

pursued as time and money permit. This might include introduction of food and cover plants which are native and non-weedy in these areas which must remain as disturbed areas. These efforts need not be large-scale operations and should as suggested be restricted to zones that will be maintained in a disturbed condition.

4. Because the Ohio-Erie Canal is a man-made canal above the valley floor of the Cuyahoga River, continual maintenance will be necessary to keep the canal operational and similar in appearance to what it was during the last century. Both geomorphological and biological forces must be dealt with in preserving the tow path in its original condition. Of these, the action of mustkrats in producing soil slumpage and eventually leakage of the towpath levee undoubtedly will be the most difficult problem to deal with.

We feel that efforts in controlling the muskrat populations should be directed toward removing their food supply and cover required for predator avoidance. If the canal can be drained periodically, especially prior to the severe cold winter weather, the roots and rhizomes of their food plants would be exposed and frozen. If the canal cannot be temporarily drained, all over-hanging trees and shrubs along the canal banks should be cut and the stumps treated to prevent regrowth. Such removal would expose the muskrat young to severe hawk and owl predation. Annual treatment of large rhizomatous plants along the canal margin with an E.P.A. approved herbicide and frequent mowing of the towpath should also be done.

If these efforts still do not control the muskrat populations,

then professional assistance should be sought from such organizations as the Ohio State Trapper's Association. If trapping is permitted by Park Service policy, a professional trapper could be consulted for such information as to how many animals should be removed by what methods. The Ohio State Trapper's Association has recommended Charles Dobbins (452-0263; North Canton, OH) to us for such consultation.

5. As in any national or state park, there are several natural areas in the CVNRA which we feel are sufficiently unique that efforts should be made to maintain them in their present state while other natural areas should be modified to achieve more effective wildlife management.

The Oxbow Lake and the adjacent floodings by beaver just north of the Ira Rd. bridge represent the most significant wetland habitats present at the CVNRA at the present time. A number of migratory waterfowl stop off here during their spring and fall flights and several important aquatic vertebrates are present as well. The largest muskrat population observed during our study occurring just west of the Oxbos Lake in a marsh area of several acres extent. This marsh and flooding of a portion of the old Erie Canal at the site are both due to beaver activity in and around the Exbow Lake.

The beaver colonies living in and near the Oxbow Lake may have to be watched in the future as these colonies will form a nucleus or source of young beaver to migrate to other streams in the CVNRA area. Resultant flooding by an increasing beaver population in the Park will of course have to be monitored in the future.

It may also be advisable to periodically monitor the levels of Giardia cysts in the intestine or feces of the resident beaver populations and to make recommendations in the future concerning this possible public health aspect of beaver activities in water which may be used downstream for human consumption.

6. The ravines that border the Cuyahoga River in the CVNRA are also unique and should be protected. The somewhat sheltered nature of these habitats plus the cold air drainage down the ravines produce microclimates that support unique plant and animal communities. Plants commonly associated with ravines include Canadian Hemlock and Yew while the northeastern Ohio fauna in such habitats commonly include Slimy Salamanders, Ravine Salamanders, Mountain Salamanders, Louisiana Water Thrush, Hooded Warblers, and Broad-winged Hawks. Monitoring of the streams in the ravines for possible chemical pollutants should be continued and large numbers of Park visitors should be excluded from the ravines because of the fragile nature of these ecosystems.

7. In general, it would be a poor allocation of time and money to engage in any large-scale program to re-establish any of CVNRA's extirpated bird and mammal species. For most of the birds and many of the mammals, CVNRA lies at the edge of normal range, so the status of the species is questionable. In addition, CVNRA itself is simply too small to provide for a substantial number of any one species. Population members would need to range into urbanized areas beyond

CVNRA bounds, which seems unlikely for most of them. Furthermore, the habitats which can reasonably be provided at CVNRA are not satisfactory matches for what these species require. In many cases, the water quality problems of the Cuyahoga River are affecting habitability. While protecting and improving water conditions are important to the good status of existing CVNRA wildlife, it is not expected that the river itself is enough to restore habitats for extirpated species at CVNRA. Even the otter, for which water quality improvement would make residence possible, would be attracted to other more extensive water bodies--lakes, reservoirs--elsewhere in the valley.

8. Through this and other inventories of the fauna and flora of the CVNRA, the species lists of the area occupied by the CVNRA are probably more complete than those in any other area of comparable size in northeastern Ohio. However, much more needs to be done of both a qualitative and quantitative nature on the plant and animal populations in the Park. To insure that future field research is done in a systematic manner, we suggest that the Park be subdivided or gridded for geographical identification. Resource management personnel could then follow a long range plan of directing research efforts to specific sections of the Park. Data gathered could then be filed according to these sections, thus providing a more systematic method of organizing data.

9. In conducting this wildlife survey, certain specific research

needs for effective management of the CVNRA have become apparent to us. Listed below are research topics which we feel should be given high priority by Park administrators.

1. A quantitative analysis of Beaver populations in the CVNRA and an assessment of their impact on Park lands.
2. Population studies of the Red-eared Slider and the Eastern Box Turtle in the CVNRA.
3. A long-range study of the Coyote in the Cuyahoga Valley, including population estimates and an evaluation of their trophic ecology.
4. A detailed assessment of the status of the Leopard Frog in the Cuyahoga Valley and a determination of causal factors for its possible decline in numbers.
5. A detailed analysis of population numbers and structure of Ambystomatid salamanders in the CVNRA for use as bench mark data in case of increasingly acid rain in northeastern Ohio.
6. An inventory of migratory and non-migratory bats in the CVNRA.
7. Manipulation of natural food and cover as a means of Muskrat population regulation along the Ohio-Erie Canal where it is being preserved as a man-made feature.
8. Qualitative and quantitative analyses of the fish populations of the Cuyahoga River within the CVNRA.
9. Foot-traffic intensity and wildlife activity patterns in CVNRA.
10. The importance of CVNRA as a migrant bird refuge in

northeastern Ohio.

11. Utilization by wildlife of unique introduced and natural coniferous habitats at CVNRA.
12. Habitat changes and population dynamics of Bank Swallow colonies at CVNRA.
13. Water quality and streamside bird populations of the watercourses of CVNRA.
14. Succession of wildlife species in an abandoned coniferous tree nursery.

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